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Relationships between Rape and Reproductive Health Experiences among Adolescent and Young Adult Women in Atlanta, Georgia

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An abstract of
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Abstract

Relationships between Rape and Reproductive Health Experiences among Adolescent and Young Adult Women in Atlanta, Georgia

By Tyiesha Danielle Short

Introduction. Unintended pregnancy has been associated with numerous negative health and social outcomes for both mother and their children. Adolescent and young adult women not only make up the largest proportions of unintended pregnancies, but they also are more likely to be vulnerable to the experience of sexual abuse and rape.

Objective. To examine the relationships between rape and three reproductive health experiences including sexual activity, contraceptive nonuse, and prior unintended pregnancy among young women. It is hypothesized that the experience of rape will be associated with an increased likelihood of prior unintended pregnancy, an increased likelihood of contraceptive nonuse, and an increased likelihood of current sexual activity.

Methods. Data for this secondary analysis were drawn from a community-based longitudinal study. The study comprised of a diverse sample of young women ages 15-24 years old residing in metropolitan Atlanta, Georgia. Of the 199 participants in the larger study, 148 young women who indicated that they have ever had sexual intercourse were analyzed through bivariate analyses and multivariable logistic regression models.

Results. Adolescent and young women in this sample were not shown to have statistically significant associations between rape and sexual activity, contraceptive nonuse, or prior unintended pregnancy after controlling for age, race, and current relationship status.

Conclusions. Despite the null findings in this analysis, previous research suggests that sexual abuse is linked to the sexual reproductive health of young women. Adolescents and young adult women who have experienced sexual abuse may be at greater risk of also experiencing negative sexual and reproductive health outcomes such as unintended pregnancy. Thus, future research is needed to further investigate the multi-faceted relationship between social and environmental factors such as rape and sexual and reproductive health outcomes and experiences among young women. In addition, targeted program development, tailored interventions, policies, and clinical responses should be explored and developed.

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INTRODUCTION

Background

Unintended Pregnancy as a public health problem

Approximately 45% of all pregnancies in the United States are unintended (Guttmacher Institute, 2016). Unintended pregnancies influence maternal and child health and are associated with a host of negative outcomes, such as low birth weight, infant and maternal mortality, and insufficient prenatal care, among others (Dott, Rasmussen, Hogue, & Reefhuis, 2009; Finer, 2010). These effects are amplified among young mothers. Nationally, unintended pregnancy rates are highest among poor and low-income women, women aged 18–24, cohabiting women and minority women (Finer & Zolna, 2016). Racial/ethnic disparities in unintended pregnancy persist, despite an overall reduction in unintended pregnancies in recent years and improvements in women's health policies that increase access to contraception. In 2011, the unintended pregnancy rate for black women (79 per 1,000) was more than double that of non-Hispanic white women (33 per 1,000) (Finer & Zolna, 2016).

Proximate behavioral determinants of unintended pregnancy

Sexual health plays an important role in physical and social well-being. Young people typically engage in experimental behaviors, including sexual behaviors, which contribute to the establishment of their individual identity (WHO, 2018). During adolescence into young adulthood, norms of behavior, sexual activity, and practices are established (Boisvert, Boislard, & Poulin, 2017). Although adolescents and young adults aged 15-24 years represent only 30% of the U.S. population who are sexually active, this age group is at an increased risk of experiencing adverse health and social outcomes,

such as sexually transmitted infections (STIs) acquisition and unintended pregnancy compared to older populations (Marcell, Wibbelsman, & Seigel, 2011; CDC, 2013). Sexual activity has implications for adolescents' and young adults' self-perception, well-being, social status, and later sexual health behaviors (Lindberg & Simet, 2012). Relationships between physical and social well-being and sexual activity have been well-documented for older women, while a dearth of research exists for young women (Davis et al., 2009). When approaching young women's sexual behavior, it is important to understand and explore determinants of these behaviors.

Engaging in unprotected sexual intercourse significantly increases the risk of STI's and unintended pregnancy (O'Donnell, O'Donnell, & Stueve, 2001). Consistent and proper use of dual protection, condoms in addition to other birth control methods, have been shown to be effective at protecting sexually active individuals against STIs, unintended pregnancies, as well as a host of other negative health outcomes (Homes, Levine & Weaver, 2004). Yet, young adults and adolescents do not adhere to regular use, dual method use, or highly effective methods and contribute to the high rates of unintended pregnancy and cases of STIs in the U.S. (CDC, 2015). Adolescents and young women can forgo contraceptive use for a plethora of reasons including, reproductive control by a partner, less perceived satisfaction during intercourse, limited access to care, and confidentiality concerns, among others (Fuentes et al., 2018; Gilliam et al., 2004). However, little research has been conducted exploring environmental and social factors that contribute to contraceptive nonuse (Gilliam, Waren & Tapia, 2004).

Gaps in research on sexual violence experiences of young women experiencing unintended pregnancy

There lies a plethora of research on the various effects of unintended pregnancy on maternal and child health outcomes (Gipson, Koenig, & Hindin, 2008) and how aspects of the social environment and adverse life events, such as the experience of discrimination, affect the reproductive health of women (MacDonald et al., 2017; Hall, Kusunoki, Gatny, & Barber, 2014). However, the bulk of sexual violence literature primarily focuses on older women, women who are married or cohabitating with a partner, or on global contexts where women are located in countries experiencing conflict (Cha & Masho, 2014; Dossa et al., 2014; Beydoun et al., 2012; Stockham et al., 2010). Thus, additional research exploring associations between a young woman's social context and her sexual and reproductive health experiences are needed.

Sexual abuse as a public health problem

Sexual abuse is defined as the unwanted sexual activity with perpetrators using force, making threats, or taking advantage of those who are not able to give consent (APA, 2017). Sexual abuse is a significant public health issue that largely affects women and has profound implications for not only their health but their autonomy as well. This study focuses on rape specifically, as an experience of sexual abuse. Though the incidence of rape is notoriously difficult to measure and largely underreported, it is estimated that 18-19% of women in the United States have experienced sexual assault at some point during their lives (Breiding et al., 2014; Kilpatrick, Resnick, Ruggiero, Conoscenti, & McCauley, 2007; Tjaden & Thoennes, 2006). This figure includes non-voluntary penetration only and does not include other forms of unwanted sexual contact,

for which the incidence is likely even higher.

Experiencing sexual abuse can have a broad range of severe negative effects on individuals, families, and society. Having experienced sexual abuse at any point during a person's life can put them at an increased risk for a myriad of mental health consequences, physical complications, and economic instability (CDC, 2015). Women of reproductive age are most often likely to experience sexual abuse at some point during their lives, specifically those who are of low socio-economic status and are of younger age (Hassedt, 2016). Moreover, adolescents and young adults who have experienced sexual abuse suffer from mental health problems and live in racially segregated communities (Trent, Clum, & Roche, 2007).

Linkages between sexual abuse and women's sexual and reproductive health

It is imperative to examine the impact of sexual abuse on women's sexual and reproductive health experiences and outcomes, in particular rape. Certain manifestations of sexual abuse, especially reproductive control, have been linked to negative sexual and reproductive health outcomes. For instance, prior research has established a link between the experience of sexual abuse in childhood and unintended teen pregnancy, with victims more likely than their peers to be coerced to have sex and not use a method of birth control during intercourse (Kirby & Lepore, 2007). Sexual abuse, particularly at a young age, has also been found to be associated with an increase in other sexual risk behaviors including a higher number of partners (Merrill, Guimond, Thomsen, & Miller, 2009), early sexual debut, and casual intercourse with strangers (Gidycz, Orchowski, King, & Rich, 2008). However, in most studies researchers focused on women who either experienced sexual abuse as a child or in a relationship with a partner. These studies did

not take into account young women's experience with sexual abuse throughout the life-course, specifically adolescence and young adulthood.

Justification

There has been very little attention to the impact of abuse on the full range of reproductive health experiences, specifically among young women, from a life course perspective (Stockham, Campbell & Celentano, 2010; Brady & Dondnberg, 2006). The psychological and social developmental demands of adolescence and young adulthood render it a time of particular vulnerability to experiencing sexual abuse and other adverse life events (Breiding et al., 2011; Boyer & Fine, 1992; Trent, Clum, & Roche, 2007). Previous studies have neglected to focus its efforts on the younger reproductive aged women (Beydoun, 2012; Campbell, Sefl, & Ahrens, 2004; Grady et al., 2015; Hassedt, 2016; Moore et al., 2010), and instead, focused primarily on sexual abuse experienced in childhood (Merrill et al., 2003; Wosu, Gelaye, & Williams; Lopez et al., 2017; Nelson, Lepore, & Mastrogiannis, 2015) and examined sexual abuse only by an intimate partner (Beydoun, 2012; Black et al., 2010; Black, Breiding & States, 2005; Breiding et al., 2010; Hess, 2012; Moore et al, 2010). In addition, research to date has made little effort to address the intersecting social and environmental contexts such as the experience of rape that shape reproductive health outcomes, specifically sexual activity, contraceptive nonuse, and unintended pregnancy, during adolescence and young adulthood. Thus, these gaps demonstrate the importance of understanding and addressing the factors in a young woman's social and environmental context, such as experiencing rape, as a critical component of sexual and reproductive health. In order to gain a more comprehensive

understanding of these issues, an approach is required that includes exploring interrelated socio-contextual factors that influence young people's lives and behaviors, and is not limited only to individualistic factors.

There remains a need to explore the impact and relationship the experience of rape has on young women, aside from educational outcomes and intimate partner violence (Hicks et al., 2017). The Young Women's Stress Study is uniquely positioned to provide data to address many of the gaps currently in the body of literature regarding sexual abuse and unintended pregnancy. By utilizing these data, additional study of the relationship between rape and sexual health behaviors and reproductive outcomes may provide further understanding of the outcomes of sexual abuse. It lends itself to investigate the ways in which rape may affect and predict the sexual and reproductive health experiences of young women. In addition, it may also illuminate nuances in contraception use and other sexual health behaviors.

This study will add an enhanced understanding of the potential relationships and impacts of rape on the sexual and reproductive health of young women. It can also impact changes in and around policies and programs addressing sexual abuse and unintended pregnancy among young women, providing insights into key aspects of those aimed at impacting health service provisions.

Theoretical Framework

This study is guided by both the Social Cognitive Theory (SCT) and the Traumagenic Dynamics Model (TD). The SCT has been used as a model for understanding the dynamic interplay of personal, behavioral, and environmental factors

that influence an individual's health decisions (Glanz, Rimer, & Viswanath, 2008). The SCT posits that there is a constant interaction between these factors such that a change in one factor has implications for the others. The SCT allows for the ability to evaluate how these factors reciprocally influence one another to create a scenario of optimal health, or reciprocal determinism. This study uses reciprocal determinism to apply three variables of interest. Behavioral factors are actions taken by an individual that interact with and influence other factors. When applying this construct, contraceptive use and sexual activity were evaluated as behavioral factors. Environmental factors focus on factors that are external to the person that affect behavior. In this analysis, rape measures the social factors in the environment that may influence an individual's behavior. Personal factors encompass cognitive or mental representation of the environment which also may affect behavior. A young woman's age, race, current relationship status, and socioeconomic status were evaluated as personal factors.

The TD model was developed to understand the trauma of sexual abuse and its short and long term effects (Finkelhor & Browne, 1988). It was created specific to childhood sexual abuse as a response to limitations of application of the Post Traumatic Stress Disorder model to sexual abuse. The TD model is a comprehensive model that posits that the experience of sexual abuse can have various effects based on the symptoms and behaviors displayed by survivors. It views the trauma of sexual abuse as a result not only from the abuse itself but also from the conditioning processes that exist before and after it. This study does not apply the four dynamics or constructs of this model. Instead, it uses the model as a guide to understand and explain the dynamic

process in which a young woman encounters before, during, and after the experience of sexual abuse.

Purpose

The present study sets out to identify the relationship between the experience of rape and sexual and reproductive health experiences including sexual activity, contraceptive use, and prior unintended pregnancy among adolescent and young adult women ages 15 to 24 in Atlanta, Georgia. To better understand these relationships, I sought to answer the following research question: Does the experience of rape predict reproductive health experiences and outcomes– specifically sexual activity, contraceptive use, and prior unintended pregnancy – among adolescents and young adult women aged 15-24 residing in metropolitan Atlanta, Georgia? It is hypothesized that the experience of rape is a predictor of sexual activity, contraceptive nonuse, and prior unintended pregnancy. It is also hypothesized that experiencing rape will be associated with an increased likelihood of prior unintended pregnancy, an increased likelihood of contraceptive nonuse, and an increased likelihood of current sexual activity.

LITERATURE REVIEW

Unintended pregnancy among young women

Unintended pregnancy, specifically during adolescence and young adulthood is a significant and persistent public health issue. Not only does unintended pregnancy have significant implications for young women, but also their babies, their families, and society (Curtin et al., 2013; Dott, Rasmussen, Hogue & Reefhuis, 2009; Kirby & Lepore, 2007). Unintended pregnancy has been associated with numerous negative health and social outcomes for both mothers and their children (Solomon-Fears, 2017). When compared with women who have planned pregnancies, mothers with unintended pregnancies are more likely to face unemployment, poverty, welfare dependency, low educational attainment and experience a greater chance of rapid repeat pregnancy (Solomon-Fears, 2017). Unintended pregnancies greatly influence the health of the mother and child and are associated with low birth weight, infant and maternal mortality, and insufficient prenatal care, among others (Dott, Rasmussen, Hogue, & Reefhuis, 2009; Finer, 2010).

In 2011, almost half (45%) of the 6.1 million pregnancies in the U.S. were unintended (Finer & Zolna, 2016). Adolescents aged 15-19 made up approximately 15% of the annual unintended pregnancy rate in the U.S., while young adults aged 20-24 made up about 25% in 2011 (Finer & Zolna, 2016). Unintended pregnancies not only have health and social implications, but also contribute to the economic burden nationally and at the state level. In 2010, compared to a national average of 68%, 80.5% of unintended pregnancies in Georgia were publicly funded (Guttmacher Institute, 2017). More specifically, the teenage childbearing cost for Georgia in 2010 was $395 million (The

National Campaign to Prevent Teen and Unplanned Pregnancy, 2017). Conservative estimates place the U.S. taxpayer burden resulting from unintended pregnancy at around $9 billion per year (Power to Decide, 2017).

Since its peak in 1991, teen pregnancy rates have been on a steady decline, with a decrease in teen pregnancy rates by 67% overall and 9% in the last year alone (Rossen et al., 2017; Finer & Zolna, 2016; Martin et al., 2015). Moreover, unintended pregnancy rates among women in their early 20s have seen significant declines as well. Between 2008 and 2011, the unintended pregnancy rate among women age 20-24 fell 22 percent (Rossen et al., 2017). However, rates of unintended pregnancy in the U.S. still remain higher than most developed countries (Kost, Maddow-Zimet & Arpaio, 2017).

In addition, stark disparities in unintended pregnancy rates persist among women of color and young women living in low-income and poverty-stricken areas (Kost &Maddow-Zimet, 2016). Despite significant declines, young women of ethnically and racially minority backgrounds experience unintended pregnancy rates two-to-three times higher than their white counterparts (Latina teens at 32 births per 1,000 and African American teens at 29 births per 1,000 vs non-Hispanic white teens at 14 births per 1,000) (Power to Decide, 2018; Kost, Maddow-Zimet & Arpaio, 2017). Adverse psychological and social consequences following unintended pregnancy are greater for younger and minority women compared to their older, socio-economically advantaged counterparts (Finer & Henshaw, 2001; Kost, Maddow-Zimet & Arpaio, 2017). Socially, unintended pregnancy is linked with poverty, reduced education and employment opportunities, and single parenthood – among others, which contribute to long-term consequences for both mothers and their offspring (Kirby & Lepore, 2007; Finer & Zolna, 2014).

Proximate Determinants of Unintended pregnancy

Unintended pregnancy can be attributed to numerous causes including lack of sexual education (Guttmacher Institute, 2017). However, two factors have been widely known to contribute to the unintended pregnancy rate: contraceptive use and sexual activity. Changes in sexual activity and contraceptive use can significantly contribute to the rise and fall of unintended pregnancies. For example, an increase in the age at first sexual intercourse attributed to a decrease in the number of young women reporting that they ever had sex (Kogan, Brody, & Chen, 2010; Boisvert, Boislard, & Poulin, 2017; O'Donnell, O'Donnell, Stueve, 2001). The U. S. Department of Health and Human Services *Healthy People 2020* campaign incorporates national goals to increase the proportion of females who have never had sexual intercourse, decrease the proportion of births that are unintended, and increase contraceptive use among females at risk of unintended pregnancy (HHS, 2017).

Determinant 1: Sexual activity among young women

Young people in the U.S. have sex for the first time at around age 17, on average (Finer & Philbin, 2014). However, they do not marry until their mid-20s or later, which puts them at a heightened risk for unintended pregnancy and sexually transmitted infections during the time between first sex and marriage (Finer & Philbin, 2014). In 2013, 44% of unmarried female 15-19 year olds had sexual intercourse and have remained steady since the early 2000s (Martinez & Abma, 2015). Moreover, adolescents who reported having early initiation of sexual intercourse were less likely than those who

initiated sex later to have used a contraceptive method at first sex (Finer & Philbin, 2014).

Various factors play a role in a young woman's sexual history and engagement in sexual activity. Their vulnerability to risky or unwanted sex and other unhealthy behaviors has been tied to a plethora of individual, familial, and community factors (Renjhen, Low, & Tong, 2016). Research exists linking sexual intercourse to be significantly associated with sociodemographics (age and gender), environmental factors (living with parents), and substance use (alcohol, cigarette, and other drugs), even after adjusting for demographic factors (Ishida, Stupp, & McDonald, 2013; Kogan et al., 2010).

It is important to consider current sexual behaviors when exploring unintended pregnancy, as it may impact behaviors regarding sexual behaviors and choices which may be related to prior history of sexual abuse. By exploring if a young woman is currently sexually active or not, effects of experiencing sexual abuse can be examined. For instance, women who have previously experienced sexual abuse can show fear or a difficult time engaging in sexual activity or the latter and have more frequent bouts of sexual intercourse (Gidycz, 2008; Merrill et al., 2003; Campbell, Sefl, & Ahrens 2004; Finkelhor et al., 2014).

Determinant 2: Contraceptive behaviors among young women

Contraceptive use and family planning is an integral component to maternal and child health and to reducing unintended pregnancies. The proportion of females aged 15-19 using contraceptives the first time they had sex has increased over the past three decades (48% in 1982 to 79% in 2013) (Martinez & Abma, 2015). According to the

Youth Risk Behavior Survey, although high school females were more likely to use a contraceptive method at first intercourse than their male counterparts, the likelihood decreased after first intercourse (CDC, 2015). Among the 30% of currently sexually active high school students responding to the survey, 14% indicated that neither they nor their partner used any method to prevent pregnancy during last sexual intercourse (CDC, 2015). Two independent studies comparing sexual and reproductive health among adolescents across countries found that although adolescents in the U.S. and Europe have similar levels of sexual activity, European adolescents were more likely to use contraceptives and to use the most effective methods consistently; they also had substantially lower pregnancy rates (Santell, Sandfort, & Orr, 2008; Sedgh et al., 2015).

Despite the passage of healthcare reform provisions requiring universal birth control and birth control counseling services free of cost sharing ("out-of-pocket" expenses), 10% of women at risk for unintended pregnancy do not use any form of birth control (Guttmacher Institute, 2017). Kearney and Levine (2012) found that only 2% of young women who do not use contraceptive methods between the ages 18 and 19 report that they are not using contraception because it is too expensive, and only a small fraction of this population cite misconceptions about their chances of getting pregnant or unexpected sexual activity as reasons for nonuse. Other factors impacting young women to forgoing contraceptive use include: reproductive control by partner, dissatisfaction during intercourse, confidentiality concerns, and negative side effects (Fuentes et al., 2018; Blanc et al., 2009; Gilliam et al., 2004).

The reproductive choices of young women have enormous impacts on not only their health, but their employment opportunities, schooling, mental health, and overall

transition to adulthood (Blanc et al., 2009). Thus, making further examination of contraceptive nonuse among these women of significant importance. Contraceptive use and nonuse may prove to be significantly different from women who have encountered significant adverse life events, such as rape.

Gaps in addressing social context and adverse life experiences

Proximate behavioral determinants of unintended pregnancy during adolescence and young adulthood, such as sexual activity and contraceptive use, have been the primary focus of family planning research for many years (Smock & Greenland, 2010; Guttmacher Institute, 2017; Jones, Mosher, & Daniels, 2012; Martinez, Copen, & Abma, 2011). However, very few studies have examined the impact of the social context, environmental factors, and social determinants of health in young women's sexual and reproductive health experiences and outcomes (Harris, 2012). Unintended pregnancy is largely associated with race, ethnicity, and socioeconomic disadvantage, therefore understanding and incorporating social determinants of health is integral to understand the role that factors, other than behavioral, play in unintended pregnancy (ACOG, 2017). It is of high public health importance to understand the interrelationships between the social context of a young women and her sexual and reproductive behaviors and experiences. Findings can garner a better understanding of the underlying issues in the sexual and reproductive health of young women. There lies a plethora of research in other areas of women's health and the older populations, but little research has focused its efforts on the younger population as it relates to the intersection of behavioral, personal, and social determinants that impact and shape sexual and reproductive health outcomes (Hansen, Lou & Olson, 2000; Khashan, et al., 2008; Williams, 2002).

Sexual abuse

Violence against women has come to be widely recognized as a violation of a woman's body and an encroachment upon her right to control her sexual, reproductive and overall health. Moreover, it is a violation of human rights, a public health concern and an increasingly common experience among women throughout the world. It is important to understand the various interrelated terms "sexual violence," "sexual abuse," and "sexual assault" and their meanings as well as the term "rape". According to the World Health Organization, sexual violence is defined as any sexual act that is perpetrated against someone's will which includes physical and sexual violence, stalking, sexual assault and sexual abuse (World Health Organization, 2017). Sexual abuse is defined as the unwanted sexual activity with perpetrators using force, making threats, or taking advantage of those who are not able to give consent (APA, 2017). The Department of Justice (DOJ) describes sexual assault as any type of sexual contact or behavior that occurs without the explicit consent of the recipient (DOJ, 2017). The DOJ defines rape as the penetration, no matter how slight … without the consent of the victim" (DOJ, 2017). For the purposes of this study, sexual abuse, sexual assault, and sexual violence will be used interchangeably. Sexual abuse experienced by an intimate partner will also be used when referring to sexual abuse. Although sexual abuse encompasses unwanted penetration, when referring to the variables utilized in this study rape will be used.

Sexual abuse among young women

Though the incidence of sexual abuse is notoriously difficult to measure, it is estimated that 20% of women in the United States have experienced it at some point

during their lives (Breiding et al., 2014). This figure includes non-voluntary penetration only and does not include other forms of unwanted sexual contact, for which the incidence is likely even higher. Recent data indicate that 91% of victims of rape and sexual assault are female, of which 81% report significant short-term or long-term impacts of their sexual abuse incident, such as Post-Traumatic Stress Disorder (PTSD) (NSVRC, 2015). Among adolescents and children, it is estimated that one in four girls will be sexually abused before turning 18 years old (NSVRC, 2015). Finkelhor et al. (2014) reported that 26.6% of females and 5.1% of males experienced sexual abuse before the age of 18. Furthermore, more than one-third of women who report being raped before age 18 also experience rape as an adult (NSVRC, 2015). Young women are also disproportionately affected by sexual abuse due to the "college culture" compared to all other age/gender groups. In terms of campus sexual assault, one in 5 women are sexually assaulted while in college (NSVRC, 2015). However, more than 90% of sexual assault victims on college campuses do not report the assault (NSVRC, 2015).

The effects of sexual abuse reverberate beyond women, affecting the health of children, families, and society via diminished parenting, incarcerated fathers, and substantial cost to human service administration. When monetized, the costs of sexual assault are estimated to be $200,000 per victim, which is second only to homicide (Georgia Department of Health, 2017). Experts estimate that sexual abuse costs the U.S. economy $127 billion, which is more than any other crime including assault, murder and drunk driving (NSVRC, 2015).

The relationship between sexual abuse and sexual activity

The experience of abuse shapes not only a young woman's exposure to subsequent violence, but also the exposure to engage in risky behaviors (Campbell, Sefl, & Ahrens, 2004). When a woman experiences abuse their reproductive autonomy is severely decreased or taken away altogether (Moore et al., 2010). Sexual abuse may be linked to a host of poor outcomes among women. Not only do experiences of sexual abuse appear to be linked to risky behavior engagement through the diminished ability to negotiate sex, power, refusal skills, and sexual norms, but the act of sexual abuse itself may have significant contributions to a woman experiencing an unintended pregnancy (Gomez, 2011;).

Experiencing sexual abuse is associated with a woman's increased likelihood of engaging in risky reproductive and sexual behaviors—such as having multiple concurrent sexual partners and alcohol use before intercourse—which can contribute to a heightened risk for STIs and unintended pregnancy (Stockman, Campbell & Celentano, 2010; Black & Breiding, 2008; Hess et al., 2012). Various studies have demonstrated a relationship between prior experience of rape or sexual assault and engagement in risky sexual behaviors such as unprotected sex, sex with multiple partners, and increased frequency of sexual activity in general. Despite the widely studied topic of sexual abuse and risky sexual behaviors, many studies have inconsistent findings in regards to sexual activity (Campbell et al, 2004; Lacelle et al., 2012; Brady & Donenberg, 2006).

A study by Campbell and colleagues (2004) found that women who had been raped were more likely to engage in risky behaviors such as unprotected sex. However, they were also disproportionately likely to experience significant decreases in sexual

activity. The researchers found that approximately one-third of survivors reported more frequent sexual activity in general and without protection post-rape, while another 40% reported significantly less frequent sexual activity after the experience. Victims who engaged in riskier behaviors reported having more sexual partners and using condoms less frequently than they did prior to their sexual assault, putting them at increased risk of experiencing an unintended pregnancy. Increases in sexual risk behaviors post rape were associated with younger age at the time of assault, higher levels of psychological distress, perpetration by an acquaintance, and substance use at the time of the incident.

In a similar study examining the association between child sexual abuse and sexual health outcomes in young adult women, researchers found that survivors of more severe child sexual assault were more likely to engage in high-risk sexual behaviors that are potentially harmful to their health as well as experiencing more problems than women who did not report experience of sexual abuse (Lacelle et al., 2012). Finkelhor & Browne's (1988) traumagenic dynamics model asserts that the emotional and mental health of an individual is disturbed by the experience of sexual abuse. The individual may have an altered view of self and the world, which disrupts their ability to experience and express emotions and actions. Although the experience of sexual abuse is event-oriented, the trauma that is experienced is process-oriented and has ongoing, dynamic processes which are often present before, during, and after the event of sexual abuse.

These inconsistent findings generate questions regarding the relationships and effects of sexual abuse on sexual and reproductive health experiences of women. Despite the wealth and breadth of knowledge each study adds to the body of literature on sexual abuse and sexual and reproductive experiences and outcomes, significant limitations

ensue with each study. The majority of these studies focused on older populations of women (Beydoun, 2012; Blanc, Tsue, Croft, & Trevitt, 2009). Many also lacked attention to how personal behavioral factors, social factors, and the environment interplay and impact the experiences of young women.

The relationship between sexual abuse and contraceptive use

A developing body of evidence suggests that childhood and adulthood sexual abuse have far-reaching effects on women (McFarlane, Malecha, Watson, et al., 2005; Tjaden & Thoennes, 2000). Exposure to any form of violence or abuse may influence the choices that women make regarding contraceptive use (Chan, & Martin, 2009). A study conducted in Missouri evaluated the impact of exposure to emotional physical, or sexual abuse on contraceptive method selection and discontinuation among women (Allsworth et al., 2013). Researchers found that previous experiences of abuse were associated with contraceptive method selection, and continuation. Thirty-three percent of women who had experienced abuse in their lifetime were less likely to select long-acting reversible contraceptive methods and more likely to use the patch, ring, or injection than those who had not experienced abuse (Allsworth et al., 2013). However, this study focused on slightly older women with an average age of 26 and included women up to 45 years old.

Sexual violence is highly related to acts of reproductive control (Hasstedt, 2016). Male reproductive controlling behaviors such as birth control sabotage directly impede a woman's ability to use her preferred method of contraception properly (Hasstedt, 2016). Furthermore, male reproductive controlling behaviors compromise a woman's ability to avoid a pregnancy when she does not want to. According to the 2010 National Intimate Partner and Sexual Violence Survey, 10.3 million women have had a partner who tried to

get them pregnant against their will or refused to use a condom (Black et al., 2011). Women's perceptions and experience of loss of reproductive control may affect their decisions to use contraception, lead to decreased conviction to use condoms, or result in partner control over administration and type of contraception used (Chan, & Martin, 2009). Moreover, women who are not correctly and consistently using a contraceptive method account for 95% of unintended pregnancies in the United States (Sonfield, Hasstedt & Gold, 2014); this includes women who are unable to use their method of choice consistently and correctly because of reproductive control or sexual abuse (Moore, Frohwirth & Miller, 2010). Many of the studies were conducted in global settings making it difficult to generalize findings (Gomez, 2011; Blanc, Tsui, Croft, & Trevitt, 2009; Elouard, Weiss, Martin-Hillber, & Merten, 2018).

The relationship between sexual abuse and unintended pregnancy

Women most at-risk of experiencing sexual abuse are also likely to have a high risk of experiencing an unintended pregnancy (Hasstedt, 2016). Sexual abuse is most prevalent among women of reproductive age (Breiding, Chen & Black, 2014). More specifically, the age group with the highest prevalence of sexual abuse, those 18-24, also have the highest rates of unintended pregnancy in the United States (Breiding, Chen & Black, 2014; Finer & Zolna, 2016). Further, a higher proportion of teen mothers report past sexual abuse than what is observed in the general teenage population (Boyer & Fine, 2009). According to the 2010 National Intimate Partner and Sexual Violence Survey, the number of women who have ever become pregnant as a direct result of rape by an intimate partner is estimated to be two million (Black et al., 2010). Moreover, five

percent of women reported an intimate partner tried to impregnate them when they did not want to get pregnant, at some point in their lifetime (Breiding, Chen & Black, 2014).

Sexual abuse also has negative impacts on the health of pregnant and postpartum women and their infants. Sexual abuse has been linked to many pregnancy complications among women prior to or during a pregnancy (Mogos et al., 2016). For instance, women experiencing sexual abuse were at greater risk for rapid, repeat pregnancies, which could limit the demonstrated health benefits of spacing and planning pregnancies (Cha & Masho, 2014). Furthermore, women experiencing sexual abuse before becoming or while pregnant are less likely to obtain early prenatal care and are more likely to experience preterm labor resulting in low-birth-weight infants (Cha & Masho, 2014). One study found that experiencing sexual abuse before delivery put a woman at more than four times the odds of stillbirth (Mogos et al., 2016); other studies have found a link between sexual abuse and postpartum depression (Brett, Barfield & Williams, 2008; Beydoun et al., 2012).

Evidence exists demonstrating relationships between gender-based violence, sexual coercion, and child abuse, and the risk of adverse reproductive health outcomes, however, most of this evidence focuses on older populations of women and those living globally. In a study conducted in Colombia, researchers found an increased risk for unintended pregnancy among women living with their partners and experiencing intimate partner violence (Gomez, 2011). Most of the research on sexual abuse and unintended pregnancy, focuses on clinical populations and pregnancy outcomes, women globally, and women who are married and neglects the experiences of many adolescent and young women who experience sexual abuse prior to cohabitation or marriage (McCloskey,

2016; Rao et al., 2017; Taft, Powell, & Watson, 2015; Raj & McDougal, 2015; Pallitto et al., 2013). Given the increasing age of marriage and vulnerability of young women to experience sexual abuse, investigating sexual abuse among this population in particular is essential to fully understand the reproductive experiences of young women.

Though several studies have documented an increase in risky behaviors among survivors of sexual abuse and rape, literature specifically relating women's experience of violence and abuse to contraception use and prior unintended pregnancy is sparse. More research is required if we are to understand the relationship between rape and sexual activity, contraceptive use, and prior unintended pregnancy. More specifically, additional information is needed with respect to rape that occurs over the life course. This study aims to assess these relationships to better understand the effects of rape on sexual and reproductive health experiences and outcomes. This study will expand the literature on sexual abuse and reproductive health experiences, specifically among young women. Results from this study can be used to develop policies focused on decreasing sexual abuse among young women and interventions focused on decreasing sexual abuse and unintended pregnancy.

METHODS

Parent Study

Study Description and Design

Data for this secondary analysis were drawn from the Young Women's Stress Study, a community-based longitudinal study designed to understand how mental health and experiences of stress impacts young women's reproductive health outcomes across adolescence and young adulthood. The Young Women's Stress Study comprised of a diverse sample of young women ages 15 through 24 years old residing in the Metro-Atlanta area. Young women were asked to participate in a longitudinal research study, which included a comprehensive initial in-person baseline psychosocial survey interview and biological data collection, followed by brief monthly online surveys for one year, then with an annual follow-up in-person interview. This secondary analysis here focuses on data collected from the baseline interview survey.

Target population

To be eligible for the longitudinal study, the young women had to meet the following criteria: English speaking, resident of the Metro-Atlanta area (within a 20-mile radius of Atlanta, GA), have access to the internet, between the ages of 15 and 24 years, and have ever received their menstrual period. Participants were excluded if: they were currently pregnant at the time of the study or have a known history of primary amenorrhea, ovarian disease, cancer and/or exposure to gonadotoxic therapies. A total of 200 participants completed baseline data, however one participant was dis-enrolled in the study due to mental health issues, leaving 199 participants enrolled in the study.

Recruitment

In spring of 2017, young women residing in the metro-Atlanta, Georgia area were recruited utilizing various active and passive sampling methods. In active recruitment situations, young women and parents of young women ages 15-24 were either handed flyers to follow up with study staff by email or phone on their own or asked to provide contact information on a form for someone from the study to reach out to them. In our passive recruitment efforts, study staff placed recruitment flyers with the study website and contact information at popular locations around the Atlanta area such as: Boys and Girls Clubs, other youth serving organizations, malls, shopping centers, libraries, MARTA stations, grocery stores, and apartment complexes. Recruitment flyers were also posted to social media sites including: Facebook, Craigslist, and Twitter.

As an additional method of recruitment, research study staff utilized a snowball sample method asking participants to share study information with their friends, family members, and others within the desired age range. Young women could either give study contact information to their friends, family members etc. or could provide study staff with their contact information during screening or after completing their baseline in-depth survey. They were also asked if they knew of other young women between 15-24 years who may be interested in participating during active recruitment. If they indicated that they did they were asked to provide that person's contact information as well. Once contact information was received study staff would reach out to potential participants and complete a variety of screening questions based on eligibility criteria or respond to young women who contacted the study's phone number or email address with a screener. If participants were eligible a baseline appointment was set-up based on their and study staff availability and enrolled in the study.

Data collection

Two types of data collection methods were utilized in this study: in-depth, in-person interviews via interviewer-administered CASI and monthly, internet surveys. Participants were also asked to provide minimally invasive biological specimens such as weight, height, waist circumference, hair sample, and a blood sample. Baseline data, derived from young women residing in the metropolitan Atlanta, Georgia area were collected mid-March to December 2017. Data from the initial in-depth, in-person interviews were used in the current study. All baseline appointments were held at the Rollins School of Public Health in a laboratory room (for biological data collection) and an interview room (for the in-depth survey). For all data collection methods, oral and written consent was obtained from all participants. Parental consent was obtained from participants under the age of 18 years with participant assent. The consent/assent was collected by a CITI-certified researcher and kept in a safe and secure cabinet. The surveys were de-identified and stored on a password protected survey database, REDCAP. The in-depth survey took approximately 1.5 to 2.5 hours to complete, depending on skip patterns and participant comprehension.

Measures

Primary predictor variable and outcome variables

Variables of interest from the baseline data of the Young Women's Stress Study were used for this analysis. Variables included: f29 (rape), i8 (sexual activity), j2 (contraceptive nonuse), and k29 (prior unintended pregnancy). Women were asked to respond to a series of questions regarding their sexual history and experiences with sex.

The series of questions included various skip patterns to identify those who have had oral, anal, and vaginal intercourse. If a woman responded that she had ever had sexual intercourse then she was asked if she has ever been forced to have sex, about her contraceptive history, prior pregnancy history, and sexual activity. The independent primary predictor variable of interest was a dichotomous variable indicating whether the participant has experienced rape. A participant is considered to have experienced rape if she has ever been physically forced to have sexual intercourse when she did not want to (1= "yes" and 2= "no").

Three outcome variables of interest related to reproductive health outcomes were examined. Participants were asked about their experience with sex. The categorical variable sexual activity was defined by when the woman's last sexual intercourse experience was. Answer options included: 1= "Within the last week", 2= "Within the last month", 3= "Within the last 2-3 months", 4= "Within the last 4-6 months", 5= "Within the last 7-12 months" and 6= "More than one year ago". For the purposes of this study, this variable was dichotomized to represent the typical definition of sexually active which is sexual intercourse within the last 3 months. Participants with answers ranging from 1 to 3 (sexual intercourse within the last 3 months) were grouped into 1= "sexually active" and those with answers ranging from 4 to 6 (sexual intercourse four months to more than one year ago) were grouped into 2= "not sexually active". This question was only asked to those who indicated that they had ever had sexual intercourse.

Participants were asked about their experiences with various forms of birth control and/or contraceptive methods. The dichotomous variable contraceptive nonuse was defined by a woman not using any method of birth control. Participants were

considered contraceptive nonusers if she has ever had sexual intercourse without using a method to prevent pregnancy such as condoms, pills, or another method (1= "yes" and 2= "no"). Participants were then asked a series of questions about their attitudes towards and experiences with pregnancy to understand their reproductive history. The final dichotomous outcome variable was defined by a young woman indicating that she had a prior unintended pregnancy. A participant is considered to have had a prior unintended pregnancy if they indicated they had ever become pregnant when they did not want to become pregnant (1= "yes" and 2= "no").

Sociodemographic variables

Specific sociodemographic variables were also considered based on literature showing their importance and associations to risky sexual behavior, reproductive health, and sexual abuse. Sociodemographic variables include the participant's current age (a1), their race/ethnicity (a4), parental income (a21), prior family receipt of public assistance (a24), and their current relationship status (f1). The continuous variable, age, asked participants how old they were in years. For the purpose of this study, age was categorized to represent "adolescents" (ages 15-17) and "young adults" (ages 18-24) for some results. Race, a categorical variable, asked participants to indicate how they usually describe themselves as far as race. Answer options included: 1= "White", 2= "Black or African American", 3= "Hispanic or Latino", 4= "Asian or Pacific Islander", 5= "American Indian, Alaskan Native or Native Hawaiian", 6= "Biracial or multiracial" and 7= "Other".

Parental income, a categorical variable, asked participants to indicate their parents' or guardians' total income without taxes in the past year. Answer choices

included: 1="$14,999 or less", 2= "$15,000 to $44,999", 3= "$45,000 to $74,999", 4= "$75,000 or greater", and 88= "Don't know". Receipt of public assistance, a dichotomous variable, identified if the participant's family ever received public assistance while growing up (1= "yes" and 2= "no"). Finally, relationship status, a categorical variable, asked participants about their current primary relationship status. Answer options included: 1= "Married", 2= "Engaged to be married", 3= "Cohabitating with partner but not married or engaged", 4= "In a serious relationship not living together", 5= "Dating or having sex casually", 6= "Not in any relationship" and 7= "Other".

Covariates

For theoretical purposes, grounded in the findings from the literature review, several covariates were considered for controlling in data analysis to reduce the possibility of confounding. Variables included age, race, and relationship status.

Analytic Sample

This study focuses on female adolescents and young adults ages 15-24. Women were excluded from the analysis if they were not sexually experienced (n=51). Three different subsamples were examined relative to the three outcome variables and the predictor variable. First, for the outcome of sexual activity, the subsample consisted of 148 female adolescents and young adults who had been sexually active (referred to as the sexual activity subsample). Second, for the outcome of contraceptive nonuse, the subsample included 101 adolescents and young adults who had sexual intercourse without using some form of contraceptive method (referred to as the contraceptive nonuse subsample). Third, for the outcome of prior unintended pregnancy, the subsample included 27 female adolescents and young adults who had indicated that they previously

had a pregnancy they did not want (referred to as the prior unintended pregnancy subsample).

Data analysis

All analyses were conducted using SAS version 9.4 (34-bit) software statistical software (SAS, 2004). Descriptive statistics for sociodemographic, the primary predictor variable, and the three reproductive health outcome variables were calculated to summarize the characteristics of the participants. A bivariate analysis was conducted with all variables using Pearson's Chi-square tests. Chi-square tests were used to explore unadjusted relationships between rape and sexual activity, rape and contraceptive use as well as rape and prior unintended pregnancy, independently. Significant differences in the three reproductive health outcomes and demographic characteristics among female adolescents and young adults who reported rape compared to those who did not report rape were examined. Although variables did not meet the bivariate analyses level of significance at $p<0.05$, they were still used in the multivariable models as they were conceptually pertinent to this study. Covariates with a significance level of $p<0.20$ were included in subsequent analyses (Hosmer & Lemeshow, 2000).

Multivariable logistic regression models were conducted using enter stepwise entry method in order to establish relationships between the primary predictor variable (rape) and each outcome variable (sexual activity, contraceptive use, and prior unintended pregnancy), controlling for the sociodemographic characteristics (age, race, and current relationship status). Overall significance of each model was assessed using the Wald chi-square statistic. Goodness of fit was assessed using the Hosmer Lemeshow test. The independent predictor variable significance was assessed and the strength of

association between the predictor variable and all three outcome variables. Only variables associated at $p<0.05$ were allowed to remain in the model. Results were presented using odds ratios with 95% confidence intervals and statistical significance was set at $p=0.05$ for all tests.

RESULTS

Descriptive Statistics

Characteristics of Sample

A total of 148 young women were included in the sample for this study. Ages ranged from 15-24 years old, with the average being 21.11 years (SD=2.40). When broken out by age group 38 young women (26%) were classified as adolescents (15-19 years) and the remaining 110 (74%) young women were classified as young adults (20-24 years). Majority of participants (n=60, 41%) described themselves as Black or African American or White 28% (n=42, 28%). Seventeen participants (12%) described themselves as Hispanic or Latino, 15 participants (10%) described themselves as Biracial or multiracial, 10 participants (7%) were Asian or Pacific Islander, two participants (1%) were American Indian, Alaskan Native or Native Hawaiian, and two participants (1%) described themselves as Other.

About one third (n=46, 31%) of participants indicated that their family received public assistance while they were growing up, while 68% (n=100) indicated they did not and one person indicated that they did not know. Most of the young women indicated that their parents' or total household income was either $45,000 to $74,999 (n=27, 18%) or $75,000 or greater (n=57, 39%) in the past year. A large proportion of the sample indicated that they were either in a serious relationship but not living with their partner (n=41, 28%) or not in any relationship (n=42, 28%). Other participants indicated that they were either dating or having sex casually (n=35, 24%) or cohabitating with partner but not married or engaged (n=19, 13%). Very few participants indicated that they were engaged to be married (n=7, 4%) or married (n=5, 3%). Characteristics of all participants in the study are shown in **Table 1**.

Predicator Variable Characteristics

The only predictor variable utilized for the purposes of this study was experience of rape. Thirty (28%) participants indicated that they had been physically forced to have sexual intercourse when they did not want to, while 76 participants (72%) indicated that they did not have that experience. The total number of participants did not equal the full analytic sample of 148 due to respondents choosing not to answer the question.

Reproductive Health Experiences

Participants' sexual and reproductive health experiences detail their experiences with contraceptives, pregnancy, and their sexual history. Most of the young women responded that they were sexually active and had sexual intercourse within the last week (n=62, 42%), within the last month (n=40, 27%), or within the last 2-3 months (n=20, 14%). Only 26 (18%) responded that they had sex between 4 months and more than one year ago. Over two-thirds of participants (n=100, 68%) had sexual intercourse without using some method of birth control, while 32% (n=48) indicated that they have never had sexual intercourse without using some method of birth control. Thirty-four participants (23%) in the study sample indicated that they had experienced a pregnancy. An overwhelming majority of those participants who had experienced a pregnancy had become pregnant when they did not want to be pregnant (n=27, 79%).

Table 1: Characteristics of Sample

Descriptive Statistics (n=148)		
Characteristic	**Frequency or Mean**	**Percentage or SD**
Age	21.11	2.4
Range	15-24 years	
Age		
Adolescents (15-19)	38	26%

Young Adult (20-24)	110	74%
Race (%):		
White	42	28%
Black	60	41%
Hispanic or Latino	17	12%
Asian or Pacific Islander	10	7%
American Indian, Alaskan Native or Native Hawaiian	2	1%
Biracial or Multiracial	15	10%
Other	2	1%
Parental Income (%):		
$14,999 or less	12	8%
$15,000 to $44,999	26	18%
$45,000 to $74,999	27	18%
$75,000 or greater	57	39%
Don't Know	25	17%
Family Receipt of Public Assistance (%):		
Yes	46	31%
No	100	68%
Don't Know	1	1%
Relationship Status (%):		
Married	5	3%
Engaged to be married	6	4%
Cohabitating with partner but not married or engaged	19	13%
In a serious relationship but not living together	41	28%
Dating or having sex casually	35	24%
Not in any relationship	42	28%
Sexual Activity (%):		
Within the last week	62	42%
Within the last month	40	27%
Within the last 2-3 months	20	14%
Within the last 4-6 months	13	9%
Within the last 7-12 months	7	5%
More than one year ago	6	4%
Sexually active (%):		
Sexually active (within past 3 months)	122	82%
Not sexually active (4 months to more than one year ago)	26	18%
Rape (%):		
Yes	30	28%
No	76	72%
Contraceptive Nonuse (%):		
Yes	100	68%
No	48	32%
Prior Unintended Pregnancy (%):		
Yes	27	79%
No	7	21%

Bivariate Analyses

In **Table 2** descriptive characteristics are provided for each subsample. Among female adolescents and young adults who reported being raped 93% (n=28) reported being currently sexually active which was equally comparable to participants who had not been raped who reported not having had sexual intercourse within the last 3 months (n=71, 93%). Seventy-three percent (n=22) of young women who were raped indicated that they had sexual intercourse without using a method to prevent pregnancy compared to 68% (n=52) of young women who had not been raped and did not always use a method to prevent pregnancy at sexual intercourse. Furthermore, 91% (n=10) of women who had experienced rape also experienced a prior unintended pregnancy compared to 71% (n=12) of women who have never experienced rape.

In regards to the demographic make-up of young women who have ever experienced rape almost all were considered young adults (n=26, 87%), majority of women described themselves as either black (n=9, 30%) or white (n=8, 27%), 30% (n=9) reported that their parents' income was $75,000 or greater, half (n=15, 50%) did not receive public assistance while growing up, and 43% (n=13) were currently in a relationship but not living with their partner.

Table 2: Characteristics of Subsamples

Bivariate Descriptive Statistics (n=106)			
Characteristic	**Experienced rape (n=30)**	**Did not experience rape (n=76)**	**P-value**
	Mean ± SD or n (%)		
Age			
Adolescents (15-19)	4 (13%)	22 (29%)	0.13
Young Adults (20-24)	26 (87%)	54 (71%)	
Race (%):			

White	8 (27%)	22 (29%)	
Black	9 (30%)	31 (41%)	
Hispanic or Latino	4 (13%)	11 (15%)	
Asian or Pacific Islander	2 (7%)	7 (9%)	0.22
American Indian, Alaskan Native or Native Hawaiian	1 (3%)	0 (0%)	
Biracial or Multiracial	5 (17%)	5 (7%)	
Other	1 (3%)	0 (0%)	
Parental Income (%):			
$14,999 or less	4 (13%)	6 (8%)	
$15,000 to $44,999	6 (20%)	12 (16%)	
$45,000 to $74,999	6 (20%)	12 (16%)	0.74
$75,000 or greater	9 (30%)	32 (42%)	
Don't Know	5 (17%)	14 (18%)	
Family Receipt of Public Assistance (%):			
Yes	14 (47%)	21 (28%)	
No	15 (50%)	54 (72%)	0.04
Don't Know	1 (3%)	0 (0%)	
Relationship Status (%):			
Married	1 (3%)	4 (5%)	
Engaged to be married	1 (3%)	5 (7%)	
Cohabitating with partner but not married or engaged	6 (20%)	13 (17%)	0.91
In a serious relationship but not living together	13 (43%)	28 (37%)	
Dating or having sex casually	9 (30%)	26 (34%)	
Not in any relationship	0 (0%)	0 (0%)	
Sexual Activity (%):			
Within the last week	16 (53%)	43 (57%)	
Within the last month	9 (30%)	21 (28%)	
Within the last 2-3 months	3 (10%)	7 (9%)	
Within the last 4-6 months	2 (7%)	1 (3%)	0.57
Within the last 7-12 months	0 (0%)	3 (4%)	
More than one year ago	0 (0%)	1 (3%)	
Sexually Active (%):			
Sexually Active (within past 3 months)	28 (93%)	71 (93%)	0.99
Not sexually active (4 months to more than one year ago)	2 (7%)	5 (7%)	
Contraceptive Nonuse (%):			
Yes	22 (73%)	52 (68%)	0..81
No	8 (27%)	24 (32%)	

Prior Unintended Pregnancy (%):				
	Yes	10 (91%)	12 (71%)	0.36
	No	1 (9%)	5 (29%)	

Results from Chi-square test & Fisher's Exact test; significant difference between groups.
Note: values may not add to 148 due to missing observations.

Bivariate analyses between all outcome variables and the predictor variable were conducted. In the unadjusted chi-square analysis, the proposed predictor was not found to be significantly associated with any of the outcome variables at a p-value of 0.05. However, all predictor variables were kept in the subsequent models due to their theoretical importance and previous literature. The results of the chi-square tests can be seen in **Table 3.**

Between-group differences were examined to determine whether baseline characteristics differed among young women who reported experiencing rape compared to those who have not. No significant differences were observed for rape and age (X^2=12.72, p=0.12), race (X^2=8.27, p=0.22), parental income (X^2=1.98, p=0.74), current relationship status (X^2=1.02, p=0.91), sexual activity (X^2=0.0003, p=0.99), contraceptive nonuse (X^2=0.246, p=0.81), or prior unintended pregnancy (X^2=1.64, p=0.35). Significant differences were, however, observed for family receipt of public assistance (X^2=6.31, p=0.04). Due to the small number of respondents in each category and missing data, Fisher's exact test, a non-parametric alternative to Chi-squared analysis was used to assess the difference between sexual activity, contraceptive nonuse, prior unintended pregnancy, and rape.

Table 3: Chi-Square Results

Rape and Reproductive Health Experiences

Pearson Chi-Square	Value	Degrees of Freedom	Significance (2-sided)
Sexual Activity	0.0003	1	P=0.99
(Fisher's Exact Test)			P=1.00
Contraception Nonuse	0.246	1	P=0.620
(Fisher's Exact Test)			P=0.815
Prior unintended Pregnancy	1.638	1	P=0.201
(Fisher's Exact Test)			P=0.355

Multivariable logistic regression models

Multivariate logistic regression models were conducted between the three outcome variables and predictor variable, while controlling for the covariates significant at the p<.20 level. The first multivariable logistic regression tested the relationship between sexual activity and rape, shown in **Table 4**. Model convergence criterion was satisfied for the model and forty-two observations were deleted due to missing values for the response or explanatory variables. The results of the first multivariable logistic regression show that sexual activity is not predicted by rape (X^2=0.009, p=0.92). Wald chi-square indicated that the overall model was not significant (X^2=4.832, p=.305) and did not have goodness of fit (X^2=5.878, p=.554).

Table 4: Rape and Sexual Activity

Model 1: Logistic regression assessing the association of sexual activity and rape

	Sexually Active (Yes)	Sexually Active (No)
Model 1		
Rape	1.10 (0.17-7.24)	1.00
Age	1.05 (0.75-1.48)	1.00
Race	4.97 (1.08-22.82)*	1.00
Relationship status	0.74 (0.30-1.86)	1.00

NOTE: * denotes significance at p=0.05

The second multivariable logistic regression tested the relationship between contraceptive nonuse and rape, shown in **Table 5**. Model convergence criterion was satisfied the model and forty-two observations were deleted due to missing values for the response or explanatory variables. The results of the second multivariable logistic regression show that contraceptive nonuse is not predicted by rape (X^2=0.021, p=0.885). The overall model was not significant (X^2=3.181, p=.528) and did not have goodness of fit (X^2=6.652, p=0.575).

Table 5: Rape and Contraception Nonuse

Model 2: Logistic regression assessing the association of contraception nonuse and rape

	Contraceptive Nonuse (Yes)	**Contraceptive Nonuse (No)**
Model 1		
Rape	0.93 (0.35-2.47)	1.00
Age	1.10 (0.92-1.32)	1.00
Race	1.26 (0.92-1.71)	1.00
Relationship status	1.02 (0.67-1.54)	1.00

The third multivariable logistic regression tested the relationship between prior unintended pregnancy and rape. Model convergence criterion was satisfied and one hundred and twenty observations were deleted due to missing values for the response or explanatory variables. The results of the third multivariable logistic regression show that prior unintended pregnancy is not predicted by rape (X^2=0.822, p=0.365). The overall model was not significant (X^2=4.564, p=0.335), but did have goodness of fit (X^2=6.200, p=0.401). Results from the logistic regression models are shown in **Table 6.**

Table 6: Rape and Prior Unintended Pregnancy

Model 3: Logistic regression assessing the association of prior unintended pregnancy and rape

	Prior Unintended Pregnancy (Yes)	Prior Unintended Pregnancy (No)
Model 1		
Rape	0.20 (0.01-6.36)	1.00
Age	0.67 (0.28-1.59)	1.00
Race	10.80 (0.34-348.17)	1.00
Relationship status	5.74 (1.01-32.56)*	1.00

NOTE: * denotes significance at p=0.05

DISCUSSION

Findings

Utilizing the Social Cognitive Theory as a framework, this analysis sought to explore whether associations exist between sexual and reproductive health experiences, including sexual activity, contraceptive nonuse, and prior unintended pregnancy (personal and behavioral factors) and rape (an environmental factor). This study found no statistically significant associations between rape and sexual activity, rape and contraception nonuse, or rape and prior unintended pregnancy among this sample of young women. Based on theoretical assumptions, it was hypothesized that the environmental factor, personal factor, and behavioral factors would be interrelated. These findings were not consistent with those of previous studies in which sexual abuse has been linked to sexual activity, contraceptive nonuse, unintended pregnancy (Hess et al., 2012; Gomez, 2011; Stockman, Campbell & Celentano, 2010; Black & Breiding, 2008). These contradicting results may be related to differences in the sample population among the various studies. It is possible that the sample size was not large enough to garner significant results. The previous studies comprised of much larger sample sizes. Although the original population started at 199 young women, skip patterns and responses on their experiences dwindled some variables to less than 30 young women. Additionally, the decision to specifically only account young women who had experienced forced sexual intercourse from another person significantly limited the number of women who would have been placed in that category if other components of sexual abuse and violence were taking into account.

It is thought that research exploring sexual abuse should take into consideration place – as the places people live and their neighborhood characteristics can have a large influence on the tolerance and acceptance of the act of sexual abuse (Wee et al., 2016; Abeya, Afework & Yalew, 2012). For example, if a young woman lives in an area or neighborhood where members of the community exhibit attitudes and beliefs that are tolerating towards the act, then perpetrators will be more likely to continue their behaviors and women who experience sexual abuse will not report or seek help. It is also important to note that the outcome variable, contraceptive nonuse, could have been more specific and included a time period to produce more significant results. Without establishing when a young woman had sexual intercourse without using a birth control method to prevent pregnancy it is difficult to determine how much of an effect rape had on her nonuse of contraception. Also, this study did not examine condom use separately from other forms contraceptive methods. Previous studies do not combine condom use and other contraceptive methods due to condom use being often controlled by the other participant in the act rather than the young woman.

Despite the statistically insignificant study findings, important information can still be gleaned from this sample of young women living in Atlanta, Georgia. First, both young women who have and have not experienced rape have similar patterns of sexual activity engagement. Young women who did and did not experience rape were equally likely to report being sexually active. Second, despite the plethora of evidence surrounding the outcomes of engaging in risky sexual behaviors, a large proportion of young women are still having sexual intercourse without using a method to prevent pregnancy. Contraceptive nonuse is likely affected by many factors, however, the current

study was unable to prove these influences stemmed from rape. Future work should be conducted utilizing various predictor variables related to adverse life events. Understanding risk factors related to contraceptive nonuse is important in order to address larger societal issues such as unintended pregnancy as well as in developing effective interventions. Lastly, the timing of the experience of rape and pregnancy is important. Whether a pregnancy was experienced before, as a result of, or after a woman had been raped is unknown in this study. Although temporality was not able to be established between the experience of rape or prior unintended pregnancy, the difference between groups warrant further exploration. Examining the temporality of these events can significantly impact the way in which providers and interventions address the issues of unintended pregnancy, gender equity and violence against women.

Although results were not significant for this population, there are indications that further research is still needed examining significant sociodemographic variables in our analysis. There were significant differences between the young women who had experienced rape subsample and those who had not as it pertains to receipt of public assistance. Receipt of public assistance was operationalized as a way to identify the socioeconomic status of young women. Parental income was also assessed to understand the socioeconomic status of the young women, however significant differences were not shown in the analysis. Because socioeconomic status can be assessed in a number of different ways, it is important to hone in on sociodemographics such as socioeconomic status in order to identify particular group most at risk of experiencing rape (Vaughn, 1958). Additional research examining these variables among young women who have experienced sexual violence is needed to better understand potential determinants and

risk factors. Findings from such research could guide future interventions and programs targeting young women who are at an increased risk of experiencing negative sexual and reproductive health outcomes.

Strengths and Limitations

The findings of this study contribute to the existing body of literature on sexual and reproductive health and rape among adolescent and young women residing in Georgia. The present study may yield results that benefit adolescent and young women who have experienced rape and create awareness of issues such as sexual behaviors and reproductive health outcomes within this population. However, there were various limitations of this study. Although the sample was racially diverse, due to the small sample size and only collecting data from participants residing in Metropolitan Atlanta, these findings may not be generalizable to young women living in relatively rural areas. Moreover, the small sample size for all variables may not have produced enough statistical power to garner statistically significant results. All responses are based on participant self-report, which are subject to biases such as social desirability and due to the sensitive nature of rape and sexual and reproductive health, these data may be subject to recall bias.

Additionally, this study only analyzed rape in the context of sexual abuse. Though a broad definition of sexual abuse that incorporates a continuum of sexual abuse experiences go beyond vaginal intercourse to include other sexual acts is used, these other acts were not examined in this study. In addition, the lifetime measure of rape does not provide information about the timing of the event of rape and in turn, does not provide the timing of unintended pregnancy or contraceptive nonuse (whether these came

before or after the experience of rape). Furthermore, the outcome variable, sexual activity, was dichotomized so that if a participant had sexual intercourse within the past 3 months of completing the survey, they would be counted as sexually active. These results could prove different if those who responded having sexual intercourse within the past 4-6 months were grouped with those who responded within the past 3 months or shorter. Future studies could benefit from improved rigor and further exploring sexual abuse experiences of young women along the continuum and ascertaining the timing of the experience of sexual abuse.

Public Health Implications and Future Directions

This study was designed to highlight the relative importance of sexual abuse and articulate the relationship between rape and sexual and reproductive outcomes. Despite the null findings in this analysis, current literature suggests that sexual abuse is highly significant to the sexual and reproductive health of young women. Sexual abuse not only threatens young women's physical health but their mental health and basic social institutions. Without public health action, detrimental effects on individuals, relationships, communities and the society are expected to result from sexual abuse and unintended pregnancy. For instance, experiencing rape may enhance the likelihood of deleterious effects and outcomes such as unintended pregnancy and STIs among adolescent and young adult women. Without increased understanding and resources to young women living in Atlanta who have experienced rape, negative health outcomes among this population are sure to ensue.

The previous well-established link between violence against women and reproductive health provides an impetus for programs to focus these issues. However,

additional research to understand the sexual and reproductive health experiences of young women who have experienced rape will contribute to targeted program development, tailored interventions, policies, and clinical responses. Currently, there is a specific focus on individual pathology rather than deficits in the broader social context that comprises the bulk of sexual abuse interventions (Finley, 2010). Incorporating components of effective gender-based violence and sexual and reproductive health programs specifically for young women are worth exploring to better serve young women and be more effective in promoting health and overall well-being (Shepard, nd). Interventions can include training providers on sexual abuse issues to reduce sexual and reproductive health risks, enhanced referral systems to sexual and reproductive health services to meet the needs of those affected by sexual abuse, and interacting with those who have experienced rape in a compassionate and non-judgmental manner. Multi-level interventions addressing trauma experienced from the result of rape and its associated outcomes are needed to improve the sexual and reproductive health and overall well-being of young women. The intersection of trauma and sexual reproductive health outcomes underscores the importance of incorporating trauma-informed care approaches to improve the effectiveness of sexual and reproductive health programs and interventions (Sales, Swartzendruber, & Phillips, 2016; Finkehlor, 2014). A trauma-informed approach for adolescent and young adult women's sexual and reproductive health can include providing medically accurate sex education, providing culturally sensitive responses and close consideration for words and attitudes when communicating, supporting youth by creating safe and stable setting to address experiences, and specialized sexual and mental health services.

Future research can also lend itself to more focused quantitative and qualitative research to better understand how and why young women who experience rape may be at an increased risk of experiencing other adverse reproductive health outcomes. Future intervention efforts within this population may also lead to increased community support for young women who experience this violation of their human rights. This research identifies potential areas that these providers and professionals may choose to address in order to create a more effective and culturally sensitive approach to working with young women who have experienced rape and promote healthy sexual and reproductive lifestyles. Many adolescents and young adults are already aware of the decreased sexual and reproductive risk that comes with abstaining from sex and using high effective contraceptive methods and proper condom use consistently. However, when put in situations where their reproductive choice is taken away (i.e. rape) from them, it proves difficult to maintain those healthy sexual and reproductive behaviors. Specific attention should be paid to changing the expected sexual and reproductive outcomes of those women who experience rape. Young women who have experienced rape should not be blamed for their experiences or what they choose to do with their sexual and reproductive freedom. Health care providers, public health, and other professionals should display a high level of sensitivity when working with this population as well as when developing programs and interventions that target them.

In addition, prevention efforts should be developed for this highly vulnerable population. The cyclical nature of violence suggests that primary prevention approaches that prevent people from becoming victims or developing violent tendencies can protect them from violence throughout their life. Comprehensive sexual abuse prevention

strategies should integrate various types of interventions with policies and strategies. Legislation can be utilized as an important tool in changing social norms and behaviors. Laws that make violent behavior an offense demonstrates that violence is not acceptable. A range of criminal justice measures can support survivors of rape. For example, increased investigations and prosecutions of sex crimes and rape shield laws that limits what the defense can ask about characteristics of the survivor, such as prior sexual history, which can affect charging decisions.

Based upon the evidence presented by prior research, behavioral, personal and environmental factors should be jointly assessed to diminish the adverse sexual and reproductive health outcomes such as unintended pregnancy among young women who have experienced sexual abuse. With revisions to the methodology, this analysis can serve as a framework for examining rape and sexual and reproductive among young women. Professionals in the field of public health have a unique opportunity to ensure that approaches to tackling adverse sexual and reproductive health outcomes utilize a multifaceted approach to best address these issues.

Conclusions

Adolescents and young adult women who have experienced rape may be at greater risk of also experiencing negative sexual and reproductive health outcomes such as unintended pregnancy. While this analysis is limited to the experiences of young women living in Metropolitan, Atlanta, Georgia, there is also a need for further research to understand these associations among young women living in rural areas. Future research may build upon this study's findings and further investigate the multi-faceted

relationship between rape and sexual and reproductive health outcomes among young women.

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