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ADVERSE CHILDHOOD EXPERIENCES, DEPRESSION, AND RESILIENCE IN AFRICAN-AMERICAN ADOLESCENTS

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Adverse Childhood Experiences, Depression and Resilience among African-American Church-Going
Adolescents

by

Jamie Freeny, DrPH, MPH

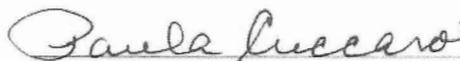
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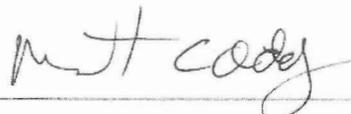
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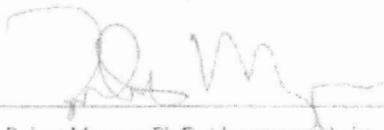
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DEDICATION

To Erma and Cecil Freeny

ADVERSE CHILDHOOD EXPERIENCES, DEPRESSION, AND RESILIENCE IN
AFRICAN-AMERICAN ADOLESCENTS

by

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Presented to the Faculty of The University of Texas

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of the Requirements

for the Degree of

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ADVERSE CHILDHOOD EXPERIENCES, DEPRESSION, AND RESILIENCE IN
AFRICAN-AMERICAN ADOLESCENTS

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School of Public Health, 2018

Dissertation Chair: Member (Chair) Melissa Peskin, PhD

Research shows that exposure to adverse childhood experiences (ACEs) is associated with an increased risk of depression in adolescents; however, no studies have examined this association in a racially homogenous sample of African-American adolescents. Furthermore, it is unknown if resilience and spirituality moderate this association in church-going African-American adolescents. Thus, the present study examined the cumulative and individual prevalence of ACEs in African-American adolescents and the association between ACEs and risk for depression in church-going African-American adolescents and examined if resilience and spirituality moderate it. Survey data were collected from African-American adolescents (n = 241) who attended youth events hosted by churches in Houston, TX. An expanded ACEs tool was used to collect data. ACE scores were summed and dichotomized to 0-3 ACEs versus 4-19 ACEs because a score of four or more indicates a higher risk for adverse mental and behavioral health outcomes. Results indicate that most of the sample had been exposed to at least one ACE and that half of the sample had been exposed to four or more ACEs. Logistic regression was conducted to examine the association between ACEs and likelihood for depression and if resilience and spirituality moderate this association. Results

suggest that ACEs are negatively associated with depression: the higher the levels of resilience and spirituality; the lower the likelihood of depression. However, resilience and spirituality did not moderate the association between ACEs and likelihood for depression. These results suggest the need to explore the prevalence of cumulative ACEs among homogenous samples of African-American adolescents and to continue to explore and address the prevalence of individual ACEs among homogenous samples of African-American adolescents. Additionally, adolescent mental health services targeting depression and strategies and programs that build resilience or foster spirituality in adolescents should be implemented among African-American adolescents.

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JOURNAL ARTICLE

Prevalence of Adverse Childhood Experiences among Church-going African-American
Adolescents

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2018

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ACES AND AFRICAN-AMERICAN ADOLESCENTS

Journal: Child Abuse & Neglect

Article Title: Prevalence of Adverse Childhood Experiences Among Church-Going African-American Adolescents

Abstract

Research shows that exposure to adverse childhood experiences (ACEs) is common among adolescents; however, no studies have examined the prevalence of ACEs in a racially homogenous sample of African-American adolescents. Thus, the present study examined the cumulative and individual prevalence of ACEs in African-American adolescents. Data were collected from African-American adolescents (n = 241) who attended youth events hosted by churches in Houston, TX. An expanded ACEs tool was used to collect data. ACE scores were summed and dichotomized to 0-3 ACEs versus 4-19 ACEs because a score of four or more indicates a higher risk for adverse mental and behavioral health outcomes. Results indicate that most of the sample had been exposed to at least one ACE and that half of the sample had been exposed to four or more ACEs. These results suggest the need to explore the prevalence of cumulative ACEs among homogenous samples of African-American adolescents and to continue to explore and address the prevalence of individual ACEs among homogenous samples of African-American adolescents.

Introduction **ADVERSE CHILDHOOD EXPERIENCES**

Exposure to traumatic events before age 18, known as adverse childhood experiences (ACEs), is an important public health issue because it can negatively affect physical and mental health over an individual's lifetime (Felitti et al., 1998). ACEs are perceived, intentional, and non-intentional acts of abuse, neglect, or household dysfunction (Ande, 2011; Felitti et al., 1998). Exposure to ACEs is associated with multiple health risk behaviors that occur during adolescence, such as early initiation of smoking, alcohol and drug abuse, multiple sexual partners, unintended pregnancies, and poor academic achievement (Bethell et al., 2013, Felitti et al., 1998, Ande et al., 2006). Furthermore, it can lead to early onset of mental illness and chronic disease, which, in turn, can lead to adverse mental and physical health outcomes in adulthood. These adverse outcomes can decrease an individual's overall health and well-being, and, ultimately, end an individual's life prematurely (Felitti et al., 1998). To interrupt the life course trajectory set by exposure to ACEs, it is necessary to identify points of intervention during adolescence to prevent progression of ACEs to adverse physical and mental health outcomes in adulthood.

Effects of ACEs

Exposure to ACEs can have immediate and long-term effects on physical and mental health, as well as on behavior, in adolescents (O'Grady et al., 1987). The immediate effects of ACEs can be seen in school behavior and classroom performance, which may include poor grades, inappropriate behavior, violence against peers, and truancy (Ande, 2006, Ande, 2010). For example, Holt et al. (2011) found that the prevalence of learning/behavior problems was higher among the 689 students with an ACE score of ≥ 4 (i.e., exposure to at least 4 or more ACEs) than among those with an ACE score of 0. Other common effects of ACEs include

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constant disruptions in the classroom, fights with other students, and multiple detentions and expulsions from school (Ande, 2006, Bethell, 2014, Burke, 2011, and Freeman, 2014). For example, in a sample of 95,677 children and adolescents, Bethell et al. (2014) found that those with two or more ACEs had lower rates of school engagement and were more than twice as likely to repeat a grade in school than those who had experienced no ACEs.

In addition to school behavior and classroom performance, exposure to ACEs has a negative effect on adolescent physical and mental health. For example, Bethell et al. (2014) found higher rates of chronic disease, overweight, and obesity among children and adolescents who had experienced ACEs compared with those who had experienced no ACEs. Similarly, Burke et al. (2011) found that, compared with those with an ACE score of 0, adolescent patients with an ACE score ≥ 4 had a higher BMI. In terms of mental health, Turner et al. (2006) found that compared with those who reported no ACEs, youth (age 13-17 years) who reported four or more types of ACEs scored three times higher on the depression scale; of these youth, 80% had clinical levels of anxiety and 86% had clinical levels of depression (Turner, Finkelhor, and Lloyd, 2006). In addition, over 80% of adolescents diagnosed with a psychiatric disorder had experienced at least one ACE (Turner, Finkelhor, and Lloyd (2006). Because exposure to ACEs increases the risk for adverse mental and physical health outcomes, it is necessary to screen for ACEs during adolescence, especially among African-American adolescents.

The negative effects of exposure to ACEs are particularly concerning among urban African-American adolescents who are exposed to high rates of abuse, neglect, household dysfunction, and community violence (Cooley-Quille, 2001, Reboussin, 2015). In a study among 701 urban pediatric clinic patients under the age of 20, slightly more than half were African American, 67% reported to experience at least one ACE (Holt et al 2011). To cope with ACEs,

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some African-American adolescents engage in coping methods, such as prayer and talking to a trusted friend or adult, while others engage in coping methods, such as marijuana use, aggressive acts, and early initiation of sex (Bryant, 2006, Fitzpatrick et al., 1993, Harris et al., 2008 Lambert et al., 2004). Engaging in risk behaviors can thus lead to adverse physical and mental health outcomes. To mitigate these adverse outcomes, ACEs should be identified early for timely and appropriate intervention (Bethell et al., 2014).

ACES: Measurement Prevalence

The original 10 ACEs (Table 1) have been studied extensively among nationally representative samples of children and adolescents (Bethell et al., 2014; Clarkson Freeman, 2014; Turner, Finkelhor, and Ormrod, 2006). In recent years, there has been a call to assess additional ACEs for ethnic-minority adolescent populations and communities because they are likely to be exposed to a wider variety of ACEs than their non-ethnic-minority counterparts (Wade et al., 2014, Finkelhor et al., 2006). ACE prevalence studies have used expanded survey tools that include the original three ACE categories (abuse, neglect, and household dysfunction) and additional hardship questions to measure exposure to adversity, such as the National Study of Children's Health (NSCH) survey and the Juvenile Victimization Questionnaire (JVQ). Additional ACE categories have included violent and property crimes, child welfare violations, violence of warfare and civil disturbances, bullying victimization, and peer/sibling victimization (Turner, Finkelhor, and Ormrod, 2006). For example, the 2011–2012 NSCH survey which comprised 95,677 children and adolescents (age 0 -17 years), revealed that nearly half of its sample reported exposure to at least one ACE and that 23% reported exposure to at least two or more of eight ACEs that covered child abuse and household dysfunction (Bethell, 2014). The 2011-2012 NSCH survey also estimated that 23% of 1,800 racially/ethnically diverse children

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and adolescents in Texas have experienced two or more ACEs. Furthermore, the National Survey of Children's Exposure to Violence study assessed exposure to 34 victimizations (ACEs) during the past year in a sample of 2,030 children and adolescents (age 2-17 years) using the JVQ. In addition to the original 10 ACEs, the JVQ includes exposure to violent and property crimes, child welfare violations, violence of warfare and civil disturbances, bullying, physical assault, peer/sibling abuse, and witnessing/indirect abuse (Turner, Finkelhor, and Ormrod, 2006). Of the sample, 71% had experienced one ACE, 14% had experienced four to six ACEs, and 7% had experienced more than six ACEs (Turner, Finkelhor, and Ormrod, 2006). Those with four or more ACEs lived in larger cities, were older, and were African-American. Specifically, in terms of race/ethnicity, African-American youth were more likely than non- African-American adolescents to experience more than six types of ACEs (Clarkson Freeman, 2014, Turner, Finkelhor, and Ormrod, 2006). These studies with nationally representative samples suggest that African-American adolescents are disproportionately affected by ACEs; however, studies are needed to confirm this finding in a racially homogenous sample of urban African-American adolescents.

Current Study

To our knowledge, no studies have examined the prevalence of ACEs using an expanded version of the original ACE questionnaire in a racially homogenous sample of urban African-American adolescents. The use of a racially homogenous sample enables more in-depth exploration of the types of ACEs affecting urban African-American adolescents (Harris et al., 2017). Furthermore, it allows the identification of the variety of ACEs within this population. Thus, the purpose of this study was twofold: (1) to determine the prevalence of cumulative and

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individual ACEs among urban African-American adolescents and (2) to examine whether prevalence estimates vary by socio-demographic characteristics such as gender and grade level. Findings will enable researchers, policymakers, and other public health professionals to better understand the most prevalent ACEs in urban African-American adolescents and the subgroups who may be most at-risk. A better understanding of ACEs is critical for deploying interventions to mitigate their potential immediate and long term adverse mental and physical health effects in this high-risk population.

Methods

Sample and Recruitment

Data were collected as part of a church-wide mental health initiative that included community events targeting the aging population, adults, and adolescents. Recruitment took place during the registration process at youth-targeted empowerment events held at three predominantly African-American churches in Houston, TX, during the spring and summer of 2017. The anonymous survey was administered to all participants with an affirmative parental consent. Participants were instructed to provide their answers directly on the paper survey using a pen and to not write their name anywhere on the survey. Once completed, surveys were collected, sealed in an envelope, and stored in a locked drawer at the church. A total of 350 parents received the parental consent form; of these, 325 gave their affirmative consent. A total of 325 participants received a survey; of these, 33 declined to complete the survey, noting they did not feel like taking the survey, there were too many questions, or they did not feel comfortable answering the questions, leaving a total sample of 292. This study was approved by the institutional review board of The University of Texas Health Science Center at Houston (HSC-SPH-18-0041).

Measures

Sociodemographic Characteristics

The demographics measured in this survey include race/ethnicity, gender, and grade-level.

Adverse childhood experiences

The ACE scale used in this survey was adapted from the original 10-item ACE questionnaire (Ande et al., 2006). The expanded ACE scale included a total of 19 items: the original 10 ACEs (Table 1) plus the following nine ACEs: (a) witness to neighborhood violence, (b) extreme economic hardship, (c) racism/unfair judgment, (d) deportation, (e) personally arrested or incarcerated, (f) personal illness, (g) been pregnant or got someone pregnant, (h) verbal or physical abuse from romantic partner, and (i) homelessness or foster care.

The total ACE score was calculated by summing the number of ACEs to which a participant responded yes. The number of ACEs ranged from 0 to 19. A score of 0 indicated the participant reported experiencing no ACEs, and a score of 19 indicated the participant reported experiencing each ACE. Missingness was addressed by dropping participants missing six or more responses. The cumulative ACE score was summed for each participant and the final ACE variable was dichotomized for analysis: participants with an ACE score of 3 or less versus those with an ACE score of 4 or more. Dichotomized ACE scores were used to determine ACE prevalence by gender and grade level. Previous research has reported a breakpoint of 4 to be significantly associated with risk behaviors and adverse physical and mental health outcomes in adolescents (Felitti et al., 2002). Four continues to be the chosen breakpoint in studies that use expanded ACEs questionnaires (Bethell, 2014). This breakpoint remains the same, regardless of the number of ACEs assessed as this presents an opportunity to explore additional breakpoints

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and their association with risk behaviors and adverse physical and mental health outcomes in adolescents.

Data Analysis

Data Preparation

Of the 292 completed surveys collected, only surveys from participants who (a) identified as black or African-American or as part African-American (multiracial) and (b) reported being in grades 6 - 12 were included (n = 254). Data were entered into an Excel spreadsheet using a double-entry method. Frequencies of missing variables were calculated, and surveys with incomplete sociodemographic items or any scale with less than 70% of items completed were removed (n = 13), bringing the analytic sample to 241.

Statistical Methods

Descriptive statistical methods were used to describe the sociodemographic characteristics of the sample. First, the ACE score for each participant was calculated by summing the yes responses. Scores were then dichotomized into two groups: 0-3 ACEs versus 4-19 ACEs. For gender and grade level, frequency tables were used to calculate the number and relative frequency in each category. Next, chi-square tests were performed to examine any differences in ACE prevalence (cumulative and individual ACEs) by gender and by grade level. SPSS Version 25 (SPSS Inc., Chicago, IL) statistical software was used to analyze all data.

Results

Sociodemographic Characteristics and Prevalence of Cumulative ACEs

Of the total sample (n=241), 63% were female and 53% were in high school. The number of ACEs ranged from 0-19. Of the 241 participants, 51% reported experiencing four or more ACEs. ACE scores did not significantly differ by gender or grade level.

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[INSERT TABLE 2 HERE]

Prevalence of Individual ACEs

Of the 19 ACEs, the most prevalent ACE was experiencing the death of a very close friend or family member (72%), followed by experiencing being pushed, grabbed, slapped, hit, or having something thrown at them (56%); having often seen or heard violence in your neighborhood or in your school's neighborhood (48%); and parental divorce (47%). The least prevalent ACE was being pregnant or gotten someone pregnant (5%), followed by being detained, arrested, or incarcerated (7%; Table 3a).

Prevalence of some ACEs did significantly differ by gender and grade level. For example, in terms of gender, male participants were significantly more likely than female participants to report having ever been detained, arrested, or incarcerated or had experienced verbal or physical abuse or threats from a romantic partner (i.e., boyfriend or girlfriend). Furthermore, female participants were more likely than male participants to report experiencing the death of a very close friend or family member. In terms of grade level, high school participants were more likely than middle school participants to report having been sworn at, insulted frequently or been put down verbally by a household member; having ever had a household member who was mentally ill, depressed, or committed suicide; and having had a household member go to jail/prison or be deported. However, there were no significant gender (Table 3b) or grade level (Table 3c) differences for physical abuse, sexual abuse, lack of emotional support or love from family, lack of food or clean clothes, parental physical abuse or witnessing parental physical abuse, parental substance abuse, parental divorce or separation, homeless or in foster care, discrimination, illness or injured, or neighborhood/school violence.

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[INSERT TABLE 3a HERE]

[INSERT TABLE 3b HERE]

[INSERT TABLE 3c HERE]

Discussion

The purpose of this study was to determine the prevalence of 19 ACEs (original 10 and additional nine ACEs that have been less commonly studied among at-risk populations) in a racially homogenous sample of urban African-American adolescents. In the current sample, 51% of participants reported experiencing four or more ACEs. This estimate is higher than estimates of 12-15% obtained from subsamples of African-American adolescents in nationally representative studies that used a similar expanded ACE scale (Clarkson Freeman, 2014, Turner, 2016). This difference may be due to different sampling methods used across studies. For example, this study used a racially homogenous sample of African-American adolescents residing in one county, compared with other studies that used samples of adolescents across multiple states. Additionally, 53% the current sample was composed of older adolescents, who are more likely than younger adolescents to have experienced more ACEs because of their age (Bethell et al., 2002; Turner, Finkelhor, and Ormrod, 2006).

In this study, the most prevalent ACE reported was experiencing the death of a very close friend or family member, followed by experiencing being pushed, grabbed, slapped, hit, or having something thrown at them, and having seen or heard violence in their neighborhood or in their school's neighborhood. There are several possible explanations for these findings. With respect to experiencing the death of a close friend or family member, death by suicide is increasing among ethnic-minority adolescent populations (National Institute of Mental Health,

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2017), and, compared with white populations, African Americans are more likely to die from chronic disease and cancer (Dong et al., 2003) which means that African-American adolescents may commonly experience the death of a loved one due to these causes. More research is needed to determine whether participants are referring to a family member, a friend, or both, and if death of a family member or friend is prevalent among other ethnic-minority groups. However, accessibility and availability of grief counseling services for African-American adolescents may be warranted to help mitigate the effects of grief. With respect to physical abuse, the observed high prevalence could be due to methods of discipline used in the home, given that physical reprimand is common in African-American families (Baumrind et al., 1997, Lau et al., 2006). Lastly, with respect to neighborhood and school violence, the observed high prevalence is consistent with that reported by studies using similar samples suggest that almost half of adolescents report having often seen or heard violence in their neighborhood or in their school's neighborhood (Finkelhor et al., 2014 and Wade et al., 2014). Collectively, our findings provide additional information on the potential number of African-American adolescents in unhealthy relationships or violent environments.

The most prevalent ACE in this study, however, is inconsistent with that in the 2011-2012 NSCH survey which has economic hardship (Sacks, Murphey, Moore, 2014). There are some possible explanations for this inconsistency. First, the 2011 NSCH survey assessed ACEs in a nationally representative sample using parental report. Second, 2011 NSCH survey assessed economic hardship slightly different than the current study. In this study, participants were asked about experiences of not having enough to eat, having to wear dirty clothes, or having no one to protect [them]. In the 2011 NSCH survey, participants were explicitly asked whether they had experienced economic hardship “somewhat often” or “very often” (i.e., the family found it hard

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to cover costs of food and housing). The ACE measure in the current study may thus need to be modified to explicitly ask about economic hardship (State of Texas Children, 2016). Future studies should continue to assess economic hardship when screening for ACEs in Texas youth because economic hardship is high in TX and was not one of the 10 original ACEs.

Other salient ACEs reported in this study include experiencing some form of discrimination (race, gender, sexual orientation, disability, or religion), exposure to parental divorce or separation, and having a household member go to jail/prison or be deported. It was expected that experiencing being treated badly because of race, gender, or sexual orientation, disability, or religion would be prevalent because it is a well-established source of chronic stress in ethnic-minority populations (Cha-Nam Shin, 2016). Although the current study assessed discrimination in general terms, discrimination may occur in the form of deliberate acts, verbal abuse, bullying, or through social media, among other means. Indeed, of the one in five students who are bullied nationally, 25% are African-American (Finkelhor, Ormrod, Turner, 2007, Stopbullying.gov, 2017). It was expected that exposure to divorce or separation would be prevalent because single-parent households are common among African-American families and African-American children are often reared in homes where their parents were never married (Youngstrom, Weist, and Albus, 2003). Furthermore, children in single-parent homes have a greater lifetime exposure to all ACEs, increasing their risk for mental health problems (Turner, Finkelhor, and Ormrod, 2006). Lastly, it was expected that exposure to parental incarceration would be prevalent because household incarceration is higher among African-American families than families of other races (Youngstrom, Weist, and Albus, 2003). Future studies, however, should separate out deportation from incarceration to allow for more accurate comparisons across ACE prevalence studies.

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In this study, the least prevalent ACE reported was being pregnant or having gotten someone pregnant, followed by being detained, arrested, or incarcerated. The low prevalence estimate for pregnancy is inconsistent with previous findings showing that pregnancy rates among African-American adolescents are high (Bryant, 2006). It is possible, however that pregnancy was under-reported in the current study because premarital sex is viewed as a sinful act by the church (Petersen and Donnerwerth, 1997). Alternatively, the church may act as a protective factor for teen pregnancy because it encourages obedience to scriptural guidance on sustaining from premarital sex, provides opportunities for socialization among like-minded peers, and allows for mentoring relationships with trusting adults (Petersen and Donnerwerth, 1997 and Salas-Wright et al., 2014). The 7% prevalence estimate for incarceration is lower than the 11.6% of African-American youth (age 10-17 years) referred to juvenile probation in 2016 in Texas (Texas Juvenile Justice Department, 2017). This finding could also be attributed to involvement in the church, which can act as a protective factor against behaviors that lead to being detained, arrested, or incarcerated (Salas-Wright et al., 2014).

There were a few significant differences in ACE prevalence by gender or grade level, which is consistent with previous research (Bethell et al. 2014). ACEs such as having experienced verbal or physical abuse or threats from a romantic partner (i.e., boyfriend or girlfriend) and having experienced the death of a very close friend or family member were significant, but this may be due to reporting differences in gender. Compared with females, males were more likely to have been detained, arrested, or incarcerated, which may be because of their association with aggressive or violent behavior (Bethell et al. 2014). ACEs tend to accumulate over time, and some ACEs may become more apparent to children as they age. As children get older, they may begin to recognize or understand ACEs such as parental mental

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illness or learn about parental suicide, incarceration, or deportation, and, therefore, may be more likely to report such ACEs. These findings suggest that all ACEs should be assessed by gender and grade level, as well as other sociodemographic characteristics, to help identify subgroups at high risk for ACEs.

This study has some limitations. First, unlike other ACE prevalence studies, it did not directly ask about exposure to property crimes, economic hardship, and peer and sibling victimizations. The term “property crime” was not in a survey question; however, the survey did ask about neighborhood violence, which could be considered similar to include property crimes (Sacks, Murphey, Moore, 2014). Additionally, the survey did not ask exclusively about peer and sibling victimizations, but it asked about verbal or physical abuse or threats from a romantic partner and physical abuse from anyone, which may include abuse by peers and siblings (Finkehlror, Ormrod, Turner, 2007). Second, the current study relies on self-reported data which cannot be independently verified. The data may also have potential sources of bias such as selective memory, social desirability, and trust that the information is maintained confidentially. Data were collected during events held at churches where many participants frequent. Thus, familiarity of peers and leaders may have caused participants to not answer honestly due to potential shame or embarrassment. To mitigate these potential biases, participants were assured of confidentiality and reminded not to put their name on the survey. Third, the current sample comprised a small population of adolescents from a large urban city and, thus, may not be representative of other adolescents in other larger or smaller urban cities. Fourth, gender and grade-level were the only demographic variables included in this study which leaves potential for additional variables such as income and parental education attainment. Fifth, we did not adjust for intra-class correlation. Furthermore, the current convenience sample was drawn from

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African-American church-going adolescents, which allows for generalization only to other urban church-going African-American adolescents.

In conclusion, this study is the first to report the prevalence and types of ACEs experienced by urban African-American church-going adolescents. Exposure to four or more ACEs was common among these African-American adolescents and cumulative ACE exposure increased with grade level. This implies that African American adolescents are exposed to a variety of traumatic events which may put them at risk for adverse physical and mental health outcomes.

The most prevalent ACE among these African-American adolescents was experiencing the death of a very close friend or family member, followed by experiencing being pushed, grabbed, slapped, hit, or having something thrown at them, and having seen or heard violence in their neighborhood or in their school's neighborhood, two of which are additional ACEs that are not included in the original ACE scale. These findings have important implications for health interventions and future research. Health risk behaviors in childhood are the bridge that link ACEs to adverse mental and physical health outcomes in adulthood because they are often used as long-term strategies to cope with the stress of ACEs (Turner, Finkelhor, and Ormrod, 2006). Interventions implemented during adolescences may defer or delay the onset of negative health behaviors before they become adverse health outcomes during adulthood. To inform timely and appropriate intervention, health and school clinicians serving predominantly African-American adolescents could conduct annual ACE screening for patients and students utilizing an expanded ACEs questionnaire. Additionally, churches serving predominantly African-American adolescents could form partnerships with mental health providers to provide individual and group grief counseling and other mental health and social services, given that those who

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experience four or more ACEs may need additional or more intense therapy. Churches could also identify trusted leaders and train them to be mentors, which may provide at-risk adolescents access to trusted adults during stressful times.

Future research should continue to examine the prevalence of ACEs among homogenous samples of youth. Research should also examine ACE relationships with various health outcomes to learn more about the effects of ACEs on health. Efforts should focus on developing interventions that address the most prevalent ACEs, accounting for the fact that ACEs lead to negative coping methods manifesting as risk behaviors among urban African-American adolescents.

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Appendix

Table 1. Ten Original ACEs^a

Childhood abuse
▪ Emotional
▪ Physical
▪ Sexual
Neglect
▪ Physical
▪ Emotional
Household Dysfunction
▪ Witnessing domestic violence
▪ Mentally ill or suicidal household members
▪ Alcohol or other substance abuse in the home
▪ Parental marital discord (as evidenced by separation or divorce)
▪ Crime in the home (as evidenced by having a household member imprisoned)

a. Adapted from Anda et al. 2006

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Variable	Total	ACE Score = 4+	Chi-square ^a	<i>p</i>
	n (%)	n (%)		
	241	122 (51%)		
Gender			0.359	0.549
Female	152 (63%)	79 (52%)		
Male	89 (37%)	43 (48%)		
Grade-level			0.139	0.709
Middle School	113 (47%)	57 (50%)		
High School	127 (53%)	66 (52%)		

^aChi-square test using 1 degree of freedom

ACE Indicator	n ^a	# yes	% yes
Original 10 ACEs			
Have you experienced being sworn at, insulted frequently, or been put down verbally by a household member (physical abuse)?	240	102	43
(a) Has your parent ever experienced being pushed, grabbed, slapped, or had something thrown at them, or been hit so hard that they were injured or had a mark (parental physical abuse)?	240	63	26
b) If so, did you see this happen?	204	39	19

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Has someone ever pushed, grabbed, slapped, hit, or threw something at you (physical abuse)?	241	136	56
Has anyone touched your private parts or asked you to touch their private parts in a sexual way, against your will, made you feel uncomfortable, or sexually abused you (sexual abuse)?	240	33	14
Have you often felt that no one in your family loved you, or looked out for you, or felt close to you (lack of emotional support or love from family)?	240	62	26
Have you ever experienced not having enough to eat, had to wear dirty clothes, or had no one to protect you (lack of food and clean clothes)?	241	32	13
Have you ever lived with someone that was a problem drinker or alcoholic, or had a drug addiction problem?	240	33	14
Were your parents/guardians ever separated or divorced?	241	113	47
Have you ever had a household member who was mentally ill, depressed, or committed suicide?	240	50	21
Have you ever had a household member go to jail/prison or be deported? ^a	240	72	30
Additional 9 ACEs			
Have you ever experienced homelessness or been in foster care?	241	25	10
Have you ever been treated badly because of race, gender, or sexual orientation, disability, or religion (discrimination)?	239	94	40
Have you experienced the death of a very close friend or family member?	241	173	72
Have you been extremely ill or injured?	241	83	34
Have you ever been pregnant or gotten someone pregnant?	241	11	5
Have you often seen or heard violence in your neighborhood or in your school's neighborhood (neighborhood/school violence)?	239	115	48
Have you been detained, arrested, or incarcerated?	239	17	7
Have you experienced verbal or physical abuse or threats from a romantic partner (i.e. boyfriend or girlfriend)?	240	28	12

^aSample size across individual items varied due to missing data

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Table 3b. Prevalence of Individual ACEs Indicators by Gender				
	Male (n=89) ^d	Female (n=152) _d	Chi- square ^c	P value
ACE Indicator	n (%)	n (%)		
Original 10 ACEs				
Have you experienced being sworn at, insulted frequently, or been put down verbally by a household member?	32 (36)	70 (46)	2.141	0.143
(a) Has your parent ever experienced being pushed, grabbed, slapped, or had something thrown at them, or been hit so hard that they were injured or had a mark?	22 (25)	41 (27)	0.112	0.738
(b) If so, did you see this happen?	13 (16)	26 (21)	0.700	0.403
Has someone ever pushed, grabbed, slapped, hit, or threw something at you?	48 (54)	88 (58)	0.358	0.549
Has anyone touched your private parts or asked you to touch their private parts in a sexual way, against your will, made you feel uncomfortable, or sexually abused you?	10 (11)	23 (15)	0.667	0.414
Have you often felt that no one in your family loved you, or looked out for you, or felt close to you?	20 (23)	42 (28)	0.834	0.361
Have you ever experienced not having enough to eat, had to wear dirty clothes, or had no one to protect you?	13 (15)	19 (13)	0.216	0.642
Have you ever lived with someone that was a problem drinker or alcoholic, or had a drug addiction problem?	10 (11)	23 (15)	0.754	0.385
Were your parents/guardians ever separated or divorced?	38 (43)	75 (49)	0.995	0.318

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Have you ever had a household member who was mentally ill, depressed, or committed suicide?	16 (18)	34 (22)	0.592	0.442
Have you ever had a household member go to jail/prison or be deported? ^b	22 (25)	50 (33)	1.879	0.171
Additional 9 ACEs				
Have you ever experienced homelessness or been in foster care?	12 (14)	13 (9)	1.468	0.226
Have you ever been treated badly because of race, gender, or sexual orientation, disability, or religion?	33 (38)	61 (40)	0.196	0.658
Have you experienced the death of a very close friend or family member?	51 (57)	122 (80)	14.609	< .0001*
Have you been extremely ill or injured?	28 (32)	55 (36)	0.555	0.456
Have you ever been pregnant or gotten someone pregnant? ^a	8 (9)	3 (2)	6.342	0.012
Have you often seen or heard violence in your neighborhood or in your school's neighborhood?	43 (48)	72 (48)	0.002	0.962
Have you been detained, arrested, or incarcerated? ^a	12 (14)	5 (3)	8.971	0.003
Have you experienced verbal or physical abuse or threats from a romantic partner (i.e. boyfriend or girlfriend)?	16 (18)	12 (8)	5.723	0.017*

*Statistically significant at $p < 0.05$.

^aFisher's exact test used due to $n < 5$.

^bDeportation was not assessed or included in the household incarceration question in original ACEs survey; however, in this study, it was added to the household incarceration question and is an additional ACE being measured.

^cChi-square test using 1 degree of freedom

^dSample size across individual items varied due to missing data

	Middle School (n=113) ^d	High School (n=127) ^d	Chi-square ^c	P value
ACE Indicator	n (%)	n (%)		
Original 10 ACEs				

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Have you experienced being sworn at, insulted frequently, or been put down verbally by a household member?	39 (35)	63 (50)	5.574	0.018*
(a) Has your parent ever experienced being pushed, grabbed, slapped, or had something thrown at them, or been hit so hard that they were injured or had a mark?	23 (20)	40 (32)	3.6241	0.057
(b) If so, did you see this happen?	17 (17)	22 (22)	0.793	0.373
Has someone ever pushed, grabbed, slapped, hit, or threw something at you?	61 (54)	75 (59)	0.519	0.471
Has anyone touched your private parts or asked you to touch their private parts in a sexual way, against your will, made you feel uncomfortable, or sexually abused you?	13 (12)	20 (16)	0.908	0.341
Have you often felt that no one in your family loved you, or looked out for you, or felt close to you?	25 (22)	37 (29)	0.0869	0.297
Have you ever experienced not having enough to eat, had to wear dirty clothes, or had no one to protect you?	25 (22)	37 (29)	1.534	0.216
Have you ever lived with someone that was a problem drinker or alcoholic, or had a drug addiction problem?	14 (13)	19 (15)	0.144	0.705
Were your parents/guardians ever separated or divorced?	51 (45)	62 (48)	0.263	0.608
Have you ever had a household member who was mentally ill, depressed, or committed suicide?	16 (14)	33 (26)	5.1398	0.023*
Have you ever had a household member go to jail/prison or be deported? ^b	25 (22)	47 (37)	6.308	0.012*
Additional 9 ACEs				
Have you ever experienced homelessness or been in foster care?	10 (9)	15 (12)	0.531	0.466
Have you ever been treated badly because of race, gender, or sexual orientation, disability, or religion?	40 (36)	54 (42)	0.943	0.332
Have you experienced the death of a very close friend or family member?	78 (69)	95 (74)	0.799	0.371
Have you been extremely ill or injured?	44 (39)	39 (31)	1.907	0.167
Have you ever been pregnant or gotten someone pregnant?	2 (2)	9 (7)	3.814	0.051
Have you often seen or heard violence in your neighborhood or in your school's neighborhood?	54 (48)	61 (49)	0.001	0.977

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Have you been detained, arrested, or incarcerated? ^a	4 (4)	13 (10)	3.863	0.049
Have you experienced verbal or physical abuse or threats from a romantic partner (i.e. boyfriend or girlfriend)?	8 (7)	20 (12)	4.170	0.041

*Statistically significant at $p < 0.05$.

^aFisher's exact test used due to $n < 5$.

^bDeportation was not assessed or included in the household incarceration question in original ACEs survey; however, in this study, it was added to the household incarceration question and is an additional ACE being measured.

^cChi-square test using 1 degree of freedom

^dSample size across individual items varied due to missing data

Adverse Childhood Experiences, Depression and Resilience in
African-American Church-Going Youth

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Abstract

Research shows that exposure to adverse childhood experiences (ACEs) is associated with an increased risk of depression in adolescents; however, no studies have examined this association in a racially homogenous sample of African-American adolescents. Furthermore, it is unknown if resilience and spirituality moderate this association in church-going African-American adolescents. Thus, the present study examined the association between ACEs and risk for depression in church-going African-American adolescents and examined if resilience and spirituality moderate it. Survey data were collected from African-American adolescents (n = 241) who attended youth-targeted events held by churches in Houston, TX. Logistic regression was conducted to examine the association between ACEs and likelihood for depression and if resilience and spirituality moderate this association. Results suggest that ACEs are negatively associated with depression: the higher the levels of resilience and spirituality; the lower the likelihood of depression. However, resilience and spirituality did not moderate the association between ACEs and likelihood for depression. Therefore, adolescent mental health services targeting depression and strategies and programs that build resilience or foster spirituality in adolescents should be implemented among African-American adolescents.

Introduction

Adverse Childhood Experiences and Depression

Adverse childhood experiences (ACEs) are types of trauma that occur during childhood (age 17 years and younger) that can lead to adverse health outcomes in adulthood (Felitti, 2002, Felitti, 1998, Schilling, 2007), including abuse, neglect, and household dysfunction (Felitti et al., 1998). Researchers estimate that nearly half of children in the United States under the age of 18 have been exposed to at least one ACE (Bethell, 2014, Finkelhor and Ormrod, 2006). The 2011-2012 National Survey of Children's Health (NSCH), which comprised 95,677 children and adolescents, estimates that in Texas about a quarter of children have experienced two or more ACEs (Bethell, 2014). There are racial/ethnic differences in ACEs: African American adolescents tend to experience more ACEs than white adolescents (Finkelhor and Ormrod, 2006). African-American adolescents also experience a wide variety of ACEs that are not included on the original ACE study survey (Felitti, 2002, Wade et al., 2014). Thus, in addition to the original ten ACEs, it is important to examine the ACEs experienced by adolescents who grew up in urban communities, such as economic hardship, negative peer relationships, discrimination, and involvement in the child welfare and juvenile justice system (Felitti, 2002, Wade et al., 2014). Exposure to ACEs has been linked to adverse mental health outcomes including depression, and depression that initiates during adolescence can have life-long effects on their health and well-being (Bethell et al., 2014, Ryttilä-Manninen, 2014).

In the United States, depression affects more than 12% of adolescents (age 12 - 17 years), 9% of whom are African American (National Institute of Mental Health [NIMH], 2015). It is estimated that by age 18, 20% of adolescents will have had at least one depressive episode, with most of these adolescents being African American (Avenevoli and Merikangas, 2006, Moon and

Rao, 2010). Although there are many etiologies for the onset of depression, the accumulated exposure to a variety of ACEs warrants attention because of their immediate and long-term effects on mental health outcomes, including depression, among children and adolescents (Chapman et al., 2004, O'Grady et al., 1987). For example, studies of national samples of adolescents show that many adolescents are exposed to adversity before age 18 and that this exposure increased the risk for depression (Bethell, et al., 2014, Schilling, 2007, Turner, Finkelhor, and Ormrod, 2006). In a study among a diverse sample of adolescents (age 13-17 years), over 80% were diagnosed with a psychiatric disorder, including depression, had experienced at least one ACE (Brockie, 2015). Furthermore, in a study among a diverse population of adolescents (age 10 - 17 years), those who had experienced four or more ACEs scored three times higher on depression and anger/aggression scales than adolescents who had experienced no ACEs (Turner, Finkelhor, and Ormrod, 2006). Exposure to traumatic experiences such as ACEs impacts brain structures and can cause prolonged or permanent damage since the child's brain is still in the developmental stages (Ande, 2006, Ande, 2010). It can damage neuron regulatory systems and lead to long-lasting nervous system issues and psychiatric problems. Problems such as these are expressed when the body remains in a state of fight or flight instead of returning to a relaxed state after exposure to a traumatic event (Ande, 2006, Ande, 2010).

Although previous studies have revealed the association between depression and various types of ACEs, none have examined the association between ACEs and likelihood for depression in a racially homogenous African-American adolescent sample. Given the prevalence among African-American adolescents, studies are needed that focus on this at-risk adolescent population. Moreover, studies that focus on a single race/ethnicity are likely to delve deeper into

constructs and provide more insight on experiences than studies that use nationally representative samples of all race/ethnicities (Bornstein, et al., 2013).

Resilience

While exploring the association between ACEs and risk for depression, it is important to also investigate protective factors that can potentially decrease the risk for depression in the presence of ACEs, so that these protective factors can be amplified and reduce the risk of having depression during adulthood. Resilience has been found to mitigate the negative effects of ACEs on depression (Anyan, et al., 2016). Resilience is the process of adapting well in the face of adversity, trauma, tragedy, threats, or significant sources of stress (APA, 2016). In one study among adolescents (age 13-17 years), resilience was found to moderate the association between adolescent stress and depressive symptoms; specifically, adolescents with high levels of stress and high resilience scores reported fewer or less severe depressive symptoms. (Anyan, et al., 2016). Other studies have found that resilience decreases the likelihood for the onset or progression of depression among adolescents with exposure to certain ACEs, including homelessness, being in the justice system, being in the welfare system, having incarcerated parents, having parents with substance abuse and mental illness, and being exposed to domestic and community violence (Master, 2001, Bethell, et al., 2014). For example, when resilience, maltreatment scores, and depression were measured together, child maltreatment was significantly correlated with depression symptoms, and resilience was negatively associated with depressive symptoms (Master, 2001). Furthermore, resilience decreased the risk for depression in those with a history of ACEs with resilience moderating the effect of childhood sexual abuse and depression symptoms (Bethell, et al., 2014). Thus, resilience may mitigate the negative impact of ACEs on the risk for depression.

Spirituality

Spirituality can help to protect against the negative effects of exposure to ACEs and is a significant predictor of higher resilience scores (Barton, Miller, 2015). For example, among adolescent girls, daily spiritual experiences, forgiveness, and positive religious coping were associated with less depressive symptomology (Desrosiers and Miller, 2007). Among adolescent boys, social support provided by congregations or religious groups was associated with less depressive symptomology (Desrosiers and Miller, 2007). Among adolescents and emerging adults, depression was found to be less frequent in those with high spirituality compared to those with low spirituality; thus, personal spirituality may be a foundation from which positive psychology traits develop (Barton and Miller, 2015).

Current Study

This study expands the current knowledge about the association between ACEs and risk for depression by examining if this association exists in a homogenous sample of African-American church-going adolescents in a large urban city, and, if so, whether it is moderated by resilience and spirituality. This will allow us to see if resilience and spirituality decrease the likelihood for depression in the presence of ACEs, and if so, are they strong enough to suggest that they be strategies in future interventions. This study aimed to (a) examine whether there is an association between the number of self-reported ACEs and likelihood for depression among African-American church-going adolescents in grades 6-12; and (b) examine whether resilience and spirituality moderate the association between ACEs and likelihood for depression among African-American church-going adolescents in grades 6-12. It was hypothesized that adolescents who have experienced four or more ACEs have a higher likelihood for depression and that resilience and spirituality moderate the association between ACEs and likelihood for depression.

Methods

Study Overview

This cross-sectional study was conducted during event registration at three youth-targeted events held at predominantly African-American churches in Houston, TX in spring 2017. Event facilitators provided an overview of the study and informed consent forms to the event attendees. Event attendees consisted of adolescents in middle school and high school that were members of the participating churches and their friends. Adolescents with affirmative parental consent were invited to participate in this study. For the purposes of this study, “church-going” is used to reflect church affiliation; because the events were hosted by churches. This study was approved by the institutional review board of The University of Texas Health Science Center at Houston (HSC-SPH-18-0041).

Data Collection

Data were collected using a self-administered, three-page, double-sided paper survey. It contained five sections (resilience, depression, spirituality, ACEs, and demographics) and a total of 73 questions. Event facilitators distributed surveys and pens to the participants. A total of 350 parents received a parental consent form; of these, 325 returned the consent form. A total of 325 surveys were distributed; of these, 292 surveys were completed. A total of 33 participants declined to complete the survey, noting they did not feel like taking the survey, there were too many questions, or they did not feel comfortable answering the questions. Of the 292 completed surveys, 38 were ineligible due to self-reported race/ethnicity and 13 had incomplete data, leaving an analytic sample of 241.

Measures

Independent Variable

Adverse childhood experiences. ACEs were measured using an expanded, 19-item version of the original ACE scale (Felitti et al., 1998). This expanded ACE scale included the original 10 ACEs: (a) physical abuse, (b) sexual abuse, (c) emotional abuse, (d) physical neglect, (e) emotional neglect, (f) mother treated violently, (g) household substance abuse, (h) household mental illness, (i) parental separation or divorce, and (j) incarcerated household member.

Because African-American adolescents are exposed to various ACEs not included on the original ACE scale, to more accurately capture the types of ACEs experienced by urban African-American adolescents, the expanded ACE scale also included the following nine ACEs (Cooley-Quille, et al., 2001, Cronholm et al., 2015, Reboussin et al., 2015 Wade et al., 2014): (a) witness to neighborhood violence, (b) extreme economic hardship, (c) racism/ unfair judgment, (d) deportation, (e) personally arrested or incarcerated, (f) personal illness, (g) been pregnant or got someone pregnant, (h) verbal or physical abuse from romantic partner, and (i) homelessness or foster care. This expanded ACE scale is similar to the 34-question Juvenile Victimization Questionnaire (JVQ) because it includes additional exposures not included on the original ACE scale (Turner, Finkelhor, and Ormrod, 2006). It is also similar to the Elsie Allen Health Center Modified Childhood Traumatic Events Scale (Elsie Scale), which has been used to screen for ACEs in urban high school students (ACEs Connection, 2015).

The total ACE score ranged from 0-19 and was calculated by summing the number of ACEs to which a participant answered yes. Exposure to no ACEs was indicated with a score of 0 and exposure to all ACEs was indicated with a score of 19. The final ACE scores were dichotomized for analysis: youth with an ACE score of 0-3 versus youth with an ACE score of 4-

19. Previous research has reported a breakpoint of 4 to be significantly associated with risk for depression as well as other negative mental health outcomes in studies using the original 10-item ACE scale or an expanded ACEs scale (Felitti et al., 2002, Turner, Finkelhor, and Ormrod, 2006).

Dependent Variable

Depression. Likelihood for depression was measured using the 22-item Columbia DISC Depression Scale (Shaffer et al., 2004, Shrout and Yager, 1989). This scale has been used in populations as young as 11 years old and provides diagnostic information (Shrout and Yager, 1989). A sample item is: “In the last 4 weeks have you often felt sad or depressed?” In a previous study, this scale had a sensitivity score of 0.75, a specificity score of 0.83, and positive predictive value of 16% (Shaffer et al., 2004). Scale scores were calculated by summing “Yes” responses for all 22 items. Like previous studies (Rausch et al., 2012), the depression scores were dichotomized for analysis: a score of 0-11 was lower likelihood for depression versus a score of 12-22 for higher likelihood for depression.

Candidate Moderator Variables

Resilience. Resilience was measured using the shortened 10-item Connor Davidson Resilience Scale (CD-RISC) (Connor and Davidson, 2003). This scale includes five factors of resilience: (a) personal competence, high standards, and tenacity; (b) trust in one’s instincts, tolerance of negative affect, and strengthening effects of stress; (c) positive acceptance of change and secure relationships; (d) control; and (e) spiritual influences. A sample item is: “I am able to adapt to change.” For this study, response options were adapted from five response options to four by removing the neutral option. Items were assessed on a 4-point scale that ranged from

“Strongly Agree” to “Strongly Disagree”. Scale scores were calculated by summing the points on each item to create a total score. Total scores were treated as continuous for analysis.

Spirituality. Spirituality was measured using the 16-item Daily Spiritual Experience Scale (DSES) (Underwood, 2006). This scale measures constructs of spirituality including: (a) gratitude, mercy, (b) sense of connection with the transcendent, (c) love, (d) awareness of inspiration and (e) a sense of deep inner peace (Underwood, 2006). A sample item is: “I feel God’s presence.” Items were assessed on a 6-point Likert scale that ranged from “many times a day” to “never”. Scale scores were calculated by summing the points on each item to create a total score. Total scores were treated as continuous for analysis.

Data Analysis

Survey data were shared with the academic partner for analysis. The data from the 292 surveys were entered into an Excel spreadsheet using the double entry method. Participants who (a) identified as black or African-American or as part African-American (multiracial), (b) reported being in grades 6–12, and (c) had complete data for each measure comprised the analytic sample (n = 241).

Descriptive statistical methods were used first to examine the characteristics of the analytic sample. Next, logistic regression was used to examine (a) the associations between ACEs, likelihood for depression, resilience, and spirituality, and (b) whether resilience and spirituality moderated the association between ACEs and likelihood for depression. First, a regression analysis (model 1) was conducted to determine if the number of ACEs was associated with likelihood for depression. Second, a regression analysis (model 2) was conducted to determine if ACEs were associated with likelihood for depression while adjusting for gender and grade level. Third, a regression analysis was conducted to determine the main effects of

resilience (model 3a) and spirituality (model 3b) on likelihood for depression while controlling for gender, grade level, and ACEs. Fourth, a regression analysis was conducted to determine the moderating effects of resilience (model 4a) and spirituality (model 4b) on the association between ACEs and likelihood for depression while adjusting for gender and grade level. An additional model was run to examine the simultaneous effects of resilience and spirituality (together), adjusted for demographics, on the association between ACEs and likelihood for depression. SPSS statistical software was used to analyze the data in this study.

Results

Descriptive Statistics

Descriptive characteristics for the analytic sample are presented in Table 1. The total sample was comprised of a homogenous sample of 241 African-American adolescents aged 10-18 years. Most participants were female (63%), and most were in high school (53%).

[INSERT TABLE 1 HERE]

Overall, 51% of participants reported exposure to four or more ACEs, and 22% reported a higher likelihood for depression. The sample mean score for resilience was 20 (SD=4.3), with a range of 4-30. The sample mean score for spirituality was 40 (SD=13.9), with a range of 15-86.

Logistic Regression Analyses

As hypothesized, exposure to four or more ACEs was associated with a higher likelihood for depression. There was a statistically significant association between experiencing 4 or more ACEs and higher likelihood for depression in the unadjusted model (OR = 6.524; 95% CI =

2.662-15.987; $p = <.0001$) and in the adjusted model (OR = 6.733; 95% CI = 2.724-16.643; $p = <.0001$) (Table 2). The association between resilience and likelihood for depression was statistically significant (OR = 0.897; 95% CI = 0.829-0.970; $p = 0.0062$) after adjusting for ACEs, gender, and grade level. Similarly, the association between spirituality and likelihood for depression was statistically significant (OR = 0.927; 95% CI = 0.881-0.976; $p = 0.0037$) after adjusting for these same variables. However, when resilience and spirituality were included in the same model, spirituality remained a significant protective factor (OR = 0.944; 95% CI = 0.892-0.998; $p = 0.0424$) but resilience did not (OR = 0.926; 95% CI = 0.853-1.006; $p = 0.679$). The association between resilience and spirituality and likelihood for depression was statistically non-significant.

[INSERT TABLE 2 HERE]

Discussion

This study extends the literature on ACEs by examining the association between exposure to ACEs and likelihood for depression among African-American church-going adolescents, as well as any moderating effects resilience and spirituality have on that association. Overall, results revealed an association between experiencing four or more ACEs and a higher likelihood for depression. However, results revealed that neither resilience nor spirituality moderate this association.

The positive association between ACEs and higher likelihood for depression suggests that depression may be an early consequence of exposure to ACEs in African-American adolescents, which aligns with previous studies (Bethell, et al., 2014, Schilling, 2007, Turner, Finkelhor, and Ormrod, 2006). If onset of depression were to occur during adolescence, the risk for becoming depressed during adulthood may increase (O'Grady et al., 1987). In fact, in the

current study, 22% of adolescents achieved scores that correspond with a higher likelihood for depression. This prevalence estimate is higher than the estimated 9% national prevalence of African-American adolescents with depression (National Institute of Mental Health, 2016). The increased likelihood for depression in this sample may be due to the use of a homogenous sample for the study, which allows for more in-depth examination and thus more representative results. Studies should further examine associations between ACEs and likelihood for depression by gender and race/ethnicity to learn more about the individual ACEs that lead to the onset of depression.

Resilience was found to be a protective factor for depression against risk for depression, which is consistent with previous studies (Bethell et al., 2014, Masten et al., 2011). However, contrary to previous studies (Anyan, et al., 2016), resilience did not moderate the association between ACEs and likelihood for depression. Resilience, alone, was not enough to counteract the negative effects of accumulated ACEs in African-American adolescents in this sample. The lack of moderation may be due to the fact that most of the sample reported high levels of resilience, which made it difficult to observe any effects. The lack of a moderating effect of resilience in the current sample presents the opportunity for future studies to explore (a) additional internal characteristics that may counteract depression outcomes in African-American adolescents who already have high levels of resilience and (b) if resilience, in the presence of other protective factors, can counteract the negative effects of accumulated ACEs in African-American adolescents.

Spirituality was also found to be a protective factor against likelihood for depression. However, like resilience, it did not moderate the association between ACEs and likelihood for depression. Because the sample was drawn from events held at three churches, it is likely that

many of the adolescents in the sample were members of one of the churches hosting the events. Thus, church participation may account for the fact that majority of the sample reported moderate to high levels of spirituality. It is also a possibility that spirituality is already acting as a protective factor and some exposures require additional support in to counteract the likelihood for depression. The lack of a moderating effect of spirituality in the current sample presents the opportunity for future studies to explore additional spiritual-based supports that may counteract depressive symptoms in African-American adolescents who already have high levels of spirituality. It also presents the opportunity to break down components of spirituality to specific constructs and their effect on likelihood for depression.

Notably, resilience and spirituality are similar and bring out many of the same personal characteristics an individual draws upon when coping with adversity (Anyan, et al., 2016, Harris et al., 2008, Van Dyke et al., 2009). Thus, they may be assessed as different constructs in one scale or as a component of each other, i.e., spirituality as a component of resilience and vice versa (Harris et al., 2008, Van Dyke et al., 2009). In this study, resilience and spirituality were assessed as two different constructs: they were measured on two different scales and were treated as two different variables. Because both were found to be significant individually, a model with both was run to explore additional associations. When both variables were in the model, spirituality remained significant, while resilience became insignificant. In other studies, authors treated spirituality as a form of resilience or used it as a means to measure resilience (Masten, 2011, Van Dyke et al., 2009). The differences in measurement and similarity as coping mechanisms may account for the lack of moderating effects for resiliency and spirituality on risk for depression. Nevertheless, the mitigating role of these factors in protecting African-American

adolescents exposed to ACEs from experiencing depressive symptoms and other mental health outcomes needs further research.

There are limitations to this study that should be noted. First, this sample may not be reflective of other African-American adolescents, given that Houston, TX, is one of the largest cities in the United States (U.S. Census, 2018). Second, this sample consisted mainly of church-going adolescents, which allows for generalization only to other urban African-American church-going adolescents. This affiliation to a church introduces additional factors, such as resource connection and social support, that may or may not be present in African-American adolescents not affiliated with a faith-based organization. Third, data were collected via self-report, which introduces potential bias because memory, readiness to share sensitive information, and embarrassment or comfort level influence participant responses to survey questions (Dong et al., 2003). Additionally, inferences about any causal relationships between ACEs and likelihood for depression cannot be made because a cross-sectional study design was used.

The prevalence of ACEs in ethnic-minority populations and the factors that may protect against adverse mental health outcomes, specifically, depressive symptoms that could stem from exposure to ACEs require further research. The current study suggests the need for intervention and prevention efforts that enhance and utilize resilience and spirituality for African-American adolescents affected by ACEs. Because the likelihood for depression was high among the current sample, strategies that increase access to mental health services should be prioritized. For instance, churches that serve predominantly African-American adolescents could increase access to mental health services by partnering with local mental health providers to co-locate services. Mental health practitioners could also provide their services at these churches. Additionally, church leaders could collaborate with social service providers to incorporate components of

spirituality into interventions and allow implementation of those interventions to occur at their churches.

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APPENDIX

Table 1. Descriptive Characteristics of the Sample (n=241)	
Demographics n, (%)	
Gender	
Female	152 (63%)
Male	89 (37%)
Grade Level	
Middle School	113 (47%)
High School	128 (53%)
Independent Variable (n, %)	
ACES	
Score of 4 to 19	122 (51%)
Score of 1-3	119 (50%)
Dependent Variable (n, %)	
Depression	
Higher Likelihood	54 (22%)
Lower Likelihood	187 (78%)
Moderator Candidates (Mean, SD, Range)	
Resilience Score ^a	20 (4.3); 4-30
Spirituality Score ^b	40 (13.9); 15-86

^a Higher score indicate greater resiliency

^b Higher score indicate greater spirituality

ACES AND AFRICAN-AMERICAN YOUTH - APPENDIX

Table 2. Results of Logistic Modeling For ACEs, Resilience (RES) and Spirituality and Depression (SP) (n = 241)					
	Aces β	RES β	SP β	ACES*RES β	SP*ACES β
model 1: crude	16.8215*				
model 2: adjusted ^a	17.0586*				
model 3a: RES main effect ^a	17.3003*	7.4826*			
model 3b: SP main effect ^a	18.5329*		8.4050*		
model 4a: RES moderating effect ^a	3.3118	0.0007		1.1102	
model 4b: SP moderating effect ^a	0.3014		5.3852		1.5744
model 5 RES and SP main effect ^a	1.2790		13.3750**		

*Denotes significance at $p = 0.05$