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Research article

Adverse childhood experiences and association with health, mental health, and risky behavior in the kingdom of Saudi Arabia

Maha Almuneef[a,b,*], Dana Hollinshead[c], Hassan Saleheen[b], Sereen AlMadani[b], Bridget Derkash[c], Fadia AlBuhairan[a], Majid Al-Eissa[a,b], John Fluke[c]

[a] King Abdullah International Medical Research Center (KAIMRC), King Saud Bin AbdulAziz University for Health Sciences (KSAU-HS), King Abdulaziz Medical City, Ministry of National Guard-Health Affairs, Riyadh, Saudi Arabia
[b] National Family Safety Program (NFSP), King Abdulaziz Medical City, Ministry of National Guard-Health Affairs, Riyadh, Saudi Arabia
[c] Kempe Center for the Prevention and Treatment of Child Abuse & Neglect, University of Colorado School of Medicine, Denver, CO, United States

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ABSTRACT

Background: The aim of this study is to determine if ACEs impact the health and risk behavior burden among Kingdom of Saudi Arabia (KSA) adults. Methods: In 2013, a cross-sectional study was conducted across KSA to identify the retrospective prevalence of ACEs and their association with high risk behaviors and chronic diseases. Surveys from 10,156 adults in all 13 Saudi regions were obtained using an Arabic version of the WHO ACE-IQ (KSA ACE-IQ).

Results: Compared to respondents reporting no ACEs, even just one ACE contributed significantly to the odds of experiencing diabetes mellitus (OR = 1.3), depression (OR = 1.32), or anxiety (OR = 1.79) outcomes. Two ACEs were necessary for statistically significant, higher odds to emerge for hypertension (OR = 1.46), mental illness (OR = 1.93), smoking (OR = 1.17), alcohol use (OR = 1.75), and drug use (OR = 1.45). Respondents who reported four or more ACEs had greater odds of coronary heart disease (OR = 1.94), and obesity (OR = 2.25). Compared to those reporting no ACEs, respondents reporting four or more ACEs had over four times the odds of Alcohol or Drug Use, Mental Illness, Depression, and/or Anxiety outcomes and more than twice the odds of diabetes, hypertension, obesity, and/or smoking outcomes.

Conclusion: Findings from this analysis underscore the potential benefit of providing focused preventative approaches to mitigating ACEs in KSA in relation to both the specific and cumulative burden of health and risky behavior outcomes.

1. Background

Childhood abuse and traumatic stressors have been linked to an increased risk of severe cognitive, behavioral, health, and social problems through the Adverse Childhood Experiences (ACEs) Study (Felitti et al., 1998). To date, relatively few studies have examined ACEs in an international context and their relevance to health and risky behavior outcomes in the Kingdom

* Corresponding author at: King Saud Bin AbdulAziz University for Health Sciences (KSAU-HS), National Family Safety Program, King Abdulaziz Medical City, Ministry of National Guard-Health Affairs P.O. Box 22490, Mail code 3202, Riyadh 11426, Saudi Arabia.
E-mail address: mahamuneef@gmail.com (M. Almuneef).

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of Saudi Arabia (KSA) are unknown. This paper provides the first analysis of the impact of Adverse Childhood Experiences (ACEs) on health and behavior outcomes among a national sample of adults in the KSA.

Many ACE studies retrospectively assess childhood experiences along several domains including emotional, physical, and sexual abuse; emotional and physical neglect; and other relational stressors including domestic violence, separation or divorce of parents, or household members involved with alcohol and/or drug abuse, criminal activities or suffering from mental illness. The version of the ACE questionnaire employed in the KSA study is based on the WHO ACE-IQ including WHO ACE-IQ's questions about peer, collective or community violence, and includes an additional item on health and risk behavior. It captures the prevalence of experiences underlying 13 ACE constructs (Almuneef, Qayad, Aleissa, & Albuhairan, 2014; World Health Organization [WHO], 2014). The number of adverse experiences are indexed as ACE scores where the numeric values reflect the sum of different ACE types experienced (World Health Organization [WHO] 2014).

Cross-study comparisons are difficult as researchers study different sets of ACE types and some limit their focus to particular sub-populations (Raleva, Pesheevska, & Sethi, 2013; Velika, Pudule, Grinberga, Springe, & Gobina, 2012). However, results from prior research on ACEs indicate they are prevalent and often co-occur, regardless of the country or sub-population in which they are studied (Björkenstam et al., 2013; Felitti et al., 1998; Raleva et al., 2013; Velika et al., 2012). Large studies in the United States (Dong, Anda et al., 2004; Sacks, Murphey, & Moore, 2014) and Sweden (Björkenstam et al., 2013) examining ten or fewer ACE types found between 41%–54% of participants had experienced one or more ACEs and between 11%–13% had experienced three or more ACEs by the age of 18. Still, state-level variations in the reported prevalence of ACEs appear to exist within the United States. Using nationally representative data from 95,677 US children regarding eight ACE types, researchers found that, depending on the state, between 44%–61% of children had not experienced an ACE, 31%–42% had experienced one or two, and the percent of children experiencing three or more ACEs ranged from 7%–17% (Sacks et al., 2014).

Health-risk factors, health outcomes, health care utilization, and quality of life have also been prospectively assessed in ACE studies (Anda et al., 2006; Edwards, Holden, Felitti, & Anda, 2003; Felitti et al., 1998) and findings from numerous studies have shown a dose-response relationship between ACE scores and health outcomes; as the number of reported ACEs increases, so does the frequency and severity of poor health outcomes. In the seminal ACEs study, Felitti and colleagues (Felitti et al., 1998) reported that, controlling for age, gender, race and educational attainment, and compared to those reporting no ACEs, individuals who experienced four or more ACEs had 1.3 times the odds for physical inactivity, 1.6 times the odds of severe obesity, 2.2 times the odds of smoking, 4.6 times the odds of depression, and 12.2 the odds for suicide attempts. Additional studies have found that individuals who experienced four or more ACEs have a 2.5-fold increased risk of panic reactions, 3.6-fold increased risk of depression, 2.4-fold increased risk of anxiety, a 2.7-fold increased risk of hallucinations, and a 1.9 fold increase in the odds of severe obesity. The risk for smoking, alcoholism, illicit or injected drug use for individuals who experienced four or more ACEs was increased by 2.1-, 1.9-, and 2.7-fold respectively (Anda et al., 2006, 2002).

Even when traditional health risk factors are controlled for, a graded relationship between the experiences of ACEs in childhood and health risk factors remains. Compared to those with no ACEs, individuals reporting four or more ACEs had 1.4 times the odds of coronary heart disease and 1.6 times the odds of a diabetes diagnosis (Dong, Giles et al., 2004; Felitti et al., 1998). Individuals with an ACE Score of $\geq$5 had 2.6 times the risk of prevalent chronic obstructive pulmonary disease (Anda et al., 2008) and individuals with an ACE Score of $\geq$6 died nearly 20 years earlier on average than those who did not experience ACEs (Brown et al., 2009).

In the KSA, chronic diseases are one of the leading causes of death (Memish et al., 2014) accounting for 69% of deaths (WHO, 2014), with indications that there is a rising disease burden associated with chronic diseases (Alquaiz et al., 2014). Child abuse and neglect (CAN) is common in KSA; in the first epidemiological CAN study conducted in Al Kharj city in 2012 adolescents (n = 2043) self-reported incidences of psychological abuse (75%), physical abuse (57%), exposure to violence (51%), neglect (50%), and sexual abuse (14%) (Al-Eissa et al., 2015). Further, an ACEs pilot study conducted in Riyadh in 2012 found that 82% of the 931 adult participants had been exposed to one or more ACEs and a third (32%) reported experiencing four or more ACEs. KSA's ACEs pilot study found the prevalence of chronic diseases in the ACEs sample were: anxiety (17%), obesity (15%), and diabetes or depression (9%), mental illness (6%), or coronary heart disease (3%) and risk behaviors included smoking (22%) regular alcohol consumption (5%), and drug use (4%).

While ACEs studies provide evidence of long-term relationships of childhood trauma and stress to important medical and public health issues, there is still much to learn. Most studies have been conducted in the United States (Dong, Anda et al., 2004; Felitti et al., 1998; Sacks et al., 2014) and while international studies exist, most have examined a limited age cohort (Björkenstam et al., 2013; Raleva et al., 2013; Velika et al., 2012), or a smaller number of ACE types than those explored in this study. Based on an examination of peer reviewed literature through PubMed, the findings from the KSA ACEs study appear to be among the very first using a version of the WHO ACE-IQ; thus this study is unique as it takes into account a broader array of traumatic experiences, an unrestricted adult-aged cohort, and was implemented in a relatively unexplored cultural context. The results consider the cumulative contribution of ACEs to an array of health outcomes identified as issues of concern in the KSA and provide insights that will inform public health initiatives targeting the prevention of family violence