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THE ROLE OF ADVERSE CHILDHOOD EXPERIENCES (ACEs) IN THE MILITARY AND PREDICTING CURRENT DISTRESS

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THE ROLE OF ADVERSE CHILDHOOD EXPERIENCES (ACEs) IN THE MILITARY AND PREDICTING CURRENT DISTRESS

DISSERTATION

A dissertation submitted in partial fulfillment of the
requirements for the degree of Doctor of Philosophy in the
College of Social Work
at the University of Kentucky

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ABSTRACT

THE ROLE OF ADVERSE CHILDHOOD EXPERIENCES (ACEs)

IN THE MILITARY AND PREDICTING CURRENT DISTRESS

The United States has been in continuous military conflicts for the past two decades. The importance of having a fully capable fighting force is unquestionable, but too often, military units are not at full capacity due to service members within a unit being unable to deploy due to mental health impediments. The surge of non-deployable SMs is a national security concern as it affects the SMs' quality of life and Department of Defense's (DoD) ability to fight today's conflicts.

This study bolsters military ACE research because it sampled more female and officer participants compared to extant military ACE studies. I applied a cross-sectional web-based survey design to recruit SMs in each branch of the US military and analyzed a sample of 600 participants across multiple branches of the US Active Duty, Reserve, and National Guard military to test the predictor variables of adverse childhood experiences (ACEs). Though the rate of ACEs in the military were unexpectedly higher than the civilian population, the data from this study and literature review suggest that intervention is appropriate and necessary to reduce the DoD's non-deployable problem. It could also simultaneously improve the forces' wellbeing by identifying ACEs in SMs upon their entry into service.

Keywords: Adverse Childhood Experiences, Military, Distress, Army, Air Force, Navy

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June 1, 2021

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Chapter One: Introduction

Background and Rationale

For over two decades, the United States (US) military has engaged in an unprecedented undertaking in protracted conflicts in the global fight against terrorism. As of 2018, more than 2.77 million Service Members (SMs) have deployed overseas (Wenger, O'Connell& Cottrell, 2018). These estimates do not include SMs deploying to other non-combat, peacekeeping missions in locations such as South Korea and Europe. Military units frequently deploy under 100% personnel capacity due to SMs within the unit becoming non-deployable (ND) (Cox, 2018). SMs become ND due to a surfeit of reasons, but mainly due to mental health impediments (Arnold et al., 2011; Cronrath et al., 2017; Curley & Warner, 2017; Sena, 2010). Substantial numbers of SMs declared as ND impose challenges to carrying out military operations. Military units typically deploy with staff and crew members. The staff are the supporting personnel, and the crew are either the fighting force, support personnel, or both. The consequences of having partial crew or staff personnel on a deployed unit are substantial to an organization. These consequences include diminished morale, diminished cohesion, dysfunctionality, ineffectiveness, and absent peer relationships. These consequences all take a physical, behavioral, emotional, and mental toll when a unit becomes partially staffed.

The number of ND SMs has become a national security concern, and the Department of Defense (DoD) has yet been able to mitigate the number of SMs who become ND. As mentioned above, mental health problems are a leading contributor for SMs to become ND. Quelling the hemorrhaging ND numbers remains a formidable challenge for the DoD (Arnold et al., 2011; Curley & Warner, 2017).

The rate of non-deployable US military SMs has increased dramatically from the beginning of the war on terror. Copp (2018) reported that out of 2.1 million SMs currently in the service, 11% or 235,00 were deemed non-deployable. More specifically, Arnold et al. (2011) indicated, over 75,000 US Army SMs are non-deployable, representing 13 % of the total Army SM population. The causes of the drastic increase in non-deployable SMs includes physical conditions and legal and administrative reasons; however, mental health problems represent the primary cause of SMs becoming non-deployable (Arnold et al., 2011). Curley et al. (2019) reported the number of non-deployable SMs reached the highest point at 15% of the total US military force. The sheer volume of non-deployable SMs is a national security concern (Arnold et al., 2011) and might require unconventional efforts to quell the rate of ND SMs and improve their quality of life.

In 2018, the US military incorporated a new policy to mitigate the surging volume of non-deployable SMs. The policy considers SMs unfit to serve in a combat capacity due to chronic physical, mental, or legal problems. The policy, *deploy or get out*, enables commanders to quickly process debilitated SMs out of the military if the SM does not become medically cleared to deploy within one year. Before crafting *deploy or get out*, the Army was comprised of 121,000 non-deployable SMs at its highest point (Cox, 2018). Many conditions that result in a SM becoming ND are temporary (Cox, 2018), yet the mental and physical injuries that commonly restrict a SM to perform their military occupational skills (MOS) is a concern. The SMs become unfit due to missed training rotations to attend medical appointments, or the SM may have limitations to carry a weapon due to a mental health diagnosis. Paradoxically, if a SM deploys

untreated, the result translates to excessive non-combat medical evacuations (Cronrath et al., 2017). Mental health impairments, such as depression, anxiety, PTSD, or suicidality, in combat zones resulted in an estimated 7,000 medical evacuations from 2001-2011. (Applewhite, Arincorayan, & Adams, 2016; Hauret, Pacha, Taylor, & Jones, 2016). Many mental health problems for the medical evacuees on deployment are often associated with being homesick or relationship problems back home (Applewhite et al., 2016; Basham, 2008; Cronrath et al., 2017). Preventing mental health problems and suicidality and decreasing ND SMs remains a herculean task and a priority for the DoD.

The military faces challenges in proactively identifying SMs susceptible to mental health problems before they become non-deployable. Understanding the underlying complexities of mental health conditions could be the catalyst for finding the antidote to decrease the US military's ND problem and improve the SMs quality of life. The *deploy or get* out policy has reduced the number of ND SMs, but mainly by separating the ND SM from service (Cox, 2018).

A substantial body of research supports the association between mental health problems and a person's history with adverse childhood experiences (ACEs). The ACEs are conceptualized as a childhood history of maltreatment, physical abuse, sexual abuse, emotional abuse, neglect, household dysfunction, and trauma (Anda et al., 2009; Barnhart & Maguire-Jack, 2016; Burke Harris, Silvério Marques, Oh, Bucci, & Cloutier, 2017; Felitti et al., 1998). In fact, due to the supporting evidence from the ACE research identifying the relationship of ACEs and negative health outcomes, many leading health organizations recommend early screening to identify ACEs in high-risk (HR) populations (Alcalá, Keim-Malpass, & Mitchell, 2017; Burke Harris et al., 2017; Kerker et al., 2016).

Mounting research also supports the association of ACEs with many other adverse health effects to include mental illness. Systematic reviews (Kalmakis & Chandler, 2015; Oh et al., 2018) and a meta-analysis (Hughes et al., 2017) synthesize this body of research and highlight the physical, mental, and behavioral health effects of ACEs. These include, but are not limited to disrupted brain development, obesity, cardiovascular disease, cancer, decreased immunity, schizophrenia, PTSD, anxiety, depression, suicidality, substance use disorders, homelessness, repeated abortions, teen pregnancy, intimate partner violence, poor school and work performance, and early death. Though not deterministic, ACEs are antecedents to seven of the ten leading causes of death globally (Felitti, 1998, 2019).

Despite the substantial body of research on health risks related to ACEs, there is a dearth of ACE research in the US military population. The studies that exist lack a representative probability sample to the US military population. The extant military ACE studies describe the rate of SMs with ACEs to a specific sample, yet the prevalence of ACEs among US SMs remains indeterminate. Knowing the prevalence of ACEs in the military would provide the DoD a start toward developing processes to identify SMs who are at an elevated risk for becoming ND.

Most studies researching ACEs in the military lack sufficient data on officers, females, all MOSs, and a theoretical framework informing their research, creating a void in military ACE research (Applewhite et al., 2016; Cabrera et al., 2007; Clarke-Walper et al., 2014; Gahm et al., 2007; Lee et al., 2016; Young et al., 2006). This study bridges that void and provides a higher percentage of females, officers, and evenly distributed

occupations. Additionally, this study illustrates and applies conceptual models to offer an approach to understanding how SMs become non-deployable

The Life Course Health Development (LCHD) model and attachment theory inform how SMs might become ND. The LCHD is an ever-evolving transdisciplinary model that merges the debate between nature vs. nurture and explains how an individual's early experiences and relationships [nurture and attachment] and their biological makeup [nature] influence a person's health trajectory from preconception to death (Halfon et al., 2018). The LCHD emphasizes the importance of relationships and attachment affecting one's health trajectory. Thus, the LCHD supports the inclusion of attachment theory concepts in this study. Moreover, the relationship between negative attachment and mental health impediments have been well established (Levine & Heller, 2012; Yerkovich & Yerkovich, 2017). In fact, researchers suggest that 73.6% to 90.5% of mental health patients with either mild to chronic conditions have an insecure attachment style (Bucci et al., 2015). In relation to health, this study specifically measures a SM's mental health and their childhood experiences.

This exploratory study provides a brief history of ACEs, conducts a literature review specific to ACEs in the military and identifies gaps within that literature, describes how this study will address some of those gaps, provides the results of the extant research, discusses the findings from the data analysis, and discusses the implications to improve future research and policy.

The central aims of this study are to: 1). Describe ACE scores in this non-clinical military sample. 2). Describe how distress scores on measures of PTSD, anxiety, and depression significantly differ by an increase in ACE score 3). Determine if a history of

ACEs can predict measures of distress. Toward this end, I ask the following two research questions and predict two hypotheses:

1. Which scores for PTSD, anxiety, and depression significantly differ by an increase in ACE score?
   H_o: PTSD, anxiety, and depression scores do not significantly differ by ACE score.
   H_a: PTSD, anxiety, and depression scores significantly differ by ACE score.
2. Can a SM's ACE score predict distress (PTSD, anxiety, or depression)?
   H_o: $\beta = 0$, there is no linear relationship between the covariates in each model.
   H_a: $\beta \neq 0$, there is a linear relationship between the covariates in each model.

A cross-sectional e-survey study design was conducted to answer the hypotheses. Participants were recruited utilizing two non-probability sampling techniques. One method recruited SMs from privately owned social media sites affiliated with each branch of the military. The other technique used a snowball method. The researcher measured distress using the Primary Care PTSD Screen for DSM-5 (PC-PTSD-5), Patient Health Questionnaire (PHQ-9) for depression, and General Anxiety Disorder (GAD-7).

Though not purposeful, this study over-sampled female and officer participants. Thus, the sample is not representative to the US military population. Another limitation is that the study is cross-sectional, effecting the generalizability. Despite these limitations, the sample remains useful for this exploratory study to bolster military ACE research by providing suggestions to improve practice, policy, and research supported by data.

Chapter Two: Literature Review

In 1998, Vincent Felitti and colleagues published the arguably seminal study describing the serendipitous discovery of prevalent adverse childhood experiences (ACEs) amongst his patients. The discovery first occurred in 1985 while Dr. Felitti assessed patients in his obesity clinic for sexual abuse. This discovery of highly prevalent childhood sexual abuse and other discovered ACEs initiated the seminal study to determine the prevalence of ACEs in the general adult population of members serviced by Kaiser Permanente, a large health maintenance organization (HMO).

The researchers analyzed the pervasiveness of physical, emotional, and sexual abuse as well as household dysfunction among 17,337 respondents from the HMO (Felitti et al., 1998). The study results indicated a strong association with respondents reporting ACEs leading from two to 46 times increased risk for multiple, negative health outcomes and behaviors. According to Google Scholar, their initial publication has been cited over 14,500 times since the writing of this study. Hundreds of scholars have published articles linking ACEs to negative physical and mental health outcomes (Burke-Harris, 2017; Felitti et al., 1998; Hughes et al., 2017; Kalmakis & Chandler, 2015).

ACE History and Current Application and Utilization

The initial discovery in the obesity program derived from a patient's childhood history of paternal incest starting at age four, which triggered the onset of her obesity. Her experience led researchers to pursue a sexual abuse history in 286 consecutive adult obesity program patients. Incredibly, 55% acknowledged experiencing contact sexual abuse in childhood or adolescence. Dr. Felitti discovered other forms of abuse and

household dysfunction while assessing patient history (V. Felitti, personal communication, October 21, 2019; Felitti et al.,1998).

These findings were so eye-opening that the question arose whether these childhood experiences were prevalent in a general population and how they manifest to other pathologies other than as obesity. The purpose of the ACE Study was to address those questions. Dr. Felitti designed the study in collaboration with Dr. Robert Anda at the CDC. It involved 17,337 mostly middle-class adult Kaiser Permanente members who underwent an unusually comprehensive medical evaluation, including detailed childhood history involving the ten most common categories of adverse childhood experiences discovered in the obesity program. The researchers developed a questionnaire soliciting traumatic experiences in the first 18 years of life to assess emotional, physical, and sexual abuse [two questions], emotional and physical neglect [three questions], and household dysfunction [five questions]. The participants were then followed for twenty years to uncover long-term negative outcomes (V. Felitti, personal communication, October 21, 2019; Felitti et al.,1998).

In brief, the study's results were remarkable: 67% reported at least one category of ACE, almost 40% reported more than two ACEs, and 12.5% reported four or more (Felitti et al., 1998). The number of ACEs an individual experienced has a dose-response relationship to multiple disease outcomes; the more ACEs an individual has, the more likely they are to have increased adverse health outcomes.

This seminal ACE Study became a catalyst to ignite many researchers to further explore ACE's associations to the researcher's specific interest or field of work. Systematic reviews (Kalmakis & Chandler, 2015; Oh et al., 2018) and a meta-analysis

(Hughes et al., 2017) culminate many of these research studies and highlight the poignant physical, mental, and behavioral health effects of ACEs. These include, but are not limited to disrupted brain development, obesity, cardiovascular disease, cancer, decreased immunity, schizophrenia, PTSD, anxiety, depression, suicidality, substance use disorders, homelessness, repeated abortions, teenage pregnancy, intimate partner violence, poor school and work performance, and early death.

ACEs are a critical predictor of an individual's health outcome. Literature has become saturated with studies replicating ACE's association with various adverse health outcomes. Nonetheless, the utility of the ACE questionnaire remained largely indeterminate until the questionnaire became a screening instrument for healthcare clinicians (Burke-Harris, 2017). The questionnaire has been through rigorous testing for reliability and internal and external validity (Dube et al., 2004; Pinto et al., 2014), supporting its efficacy to identify vulnerable and high-risk individuals and populations.

In fact, due to its prominence to identify high-risk individuals, the American Academy of Pediatricians (AAP), Substance Abuse and Mental Health Services Administration (SAMHSA), World Health Organization (WHO), Center for Disease Control and Prevention (CDC), and other health organizations encourage the use of the ACE questionnaire as a best practice screening instrument to identify high-risk populations in both children and adults (Alcalá et al., 2017; Burke Harris et al., 2017; Kerker et al., 2016). Those individuals identified with ACEs can then be referred for treatment preemptively to promote resilience and reverse the effects of ACEs. Moreover, utilizing the ACE questionnaire as a screening instrument is feasible for health care clinics and acceptable for patients to complete (Burke Harris et al., 2017; Conn et al.,

2018; Felitti, 2017; Flanagan et al., 2018; Glowa et al., 2016). As a clinical social worker for the Army, and to this author's knowledge, as of the writing of this manuscript, the Army does not utilize the ACE questionnaire despite endorsements from the organizations previously mentioned that suggest its proper utilization. To the Army's credit, health care clinicians assess for trauma, but not in a standardized, systematic method.

Despite the substantial body of research on health risks related to ACEs, there is a dearth of ACE research in the US military. Stanley and Larsen (2019) reported the association between suicide and ACEs among US SMs. A recent study reported that most SMs seeking behavioral health treatment have a history of ACEs (Applewhite et al., 2016). Other studies explored ACEs with other ailments such as alcohol abuse and misuse in SMs (Clarke-Walper et al., 2014; Young et al., 2006) and other disorders such as PTSD and depression (Cabrera et al., 2007; Gahm et al., 2007; Lee et al., 2016). These studies, including the systematic reviews by Kalmakis and Chandler (2015), Oh et al., (2018), and the meta-analysis by Hughes et al., (2017), highlight the implications of ACEs that may label the SM ND. While extant military ACE studies provide remarkable insight, it is important to more thoroughly understand the scope of the issue the military is encountering. The current studies that attempt to investigate the prevalence of ACEs in the military remain inconclusive. Determining the prevalence of ACEs in the military would provide a start toward developing policies and practices to identify SMs who are at elevated risk for becoming ND and improve a SM's health trajectory.

This literature review aims to synthesize and describe from extant literature the findings on US SMs with a history of ACEs, childhood maltreatment, childhood trauma,

and childhood abuse. The keywords searched for the journal reviews were *prevalence, child abuse, child maltreatment, childhood trauma, Army, Navy, Air Force, Marines, military,* and *adverse childhood experience.*

Literature Review Objectives

A comprehensive review of the ACE literature is too broad and beyond the scope of this study. A literature review on such a broad topic would not benefit ACE research. Therefore, the main objective of this literature review is to provide a candid and comprehensive evaluation of the empirical literature about ACEs in the US military and identify gaps and areas for potential future research. To effectively achieve this objectively, I completed these tasks:

1) Identify extant research on the prevalence of ACE among the service members in the military.
2) Identify the characteristics of the participants in the research studies.
3) Provide a comprehensive summary that identifies the authors and publication date of the identified literature, methodologies applied, study measures, the total number of participants, independent variables, the mode of data analysis, and findings or outcomes of the identified research studies.
4) Describe the methods used for sampling participants.
5) Describe the identified articles as either qualitative, quantitative, or mixed methods.
6) Effectively synthesize study results, focusing on interpreting the information extracted from the articles to suggest new contributions to existing knowledge.

This literature review is structurally guided by Chesser, Burke, Reyes, & Rohrberg (2016) follows the preferred reporting items for systematic reviews and meta-systematic analysis (PRISMA) format (Moher et al., 2009). The comprehensive literature review utilized reliable and trusted academic sources and databases to source for the peer-reviewed articles cited in this evaluation.

Moreover, this comprehensive literature review applied a thorough search strategy on the academic database that sourced the peer-reviewed articles using the following

keywords: (1) childhood trauma, (2) child maltreatment, (3) child maltreatment, (4) Army, (5) Air Force, (6) Marines, (7) Navy, (8) Military (9) prevalence of ACE, and (9) adverse childhood experience. The author searched the terms mentioned above using the academic database Medline, Academic Search Complete, Business Source Complete, CINAHL full text, PsychInfo, social work abstracts, and Psychology and Behavioral Science Collection. There were no known systematic reviews found on this topic specifically for the military.

Inclusion & Exclusion Criteria

The search for reliable sources was thoroughly analyzed through a comprehensive inclusion and exclusion criteria. The inclusion criteria comprised of identifying and selecting published peer-reviewed articles published from 1997 to 2020. The author strategically chose the year 1997 because it was one year prior to the inception of the watershed ACE research publication from Fellitti et al. (1998.) Articles before the Fellitti study may have used terms such as *abuse* or *maltreatment*. Therefore, terms synonymous to ACEs were included in the search criteria. Additionally, the author sourced information from trusted, quality, and reliable peer-reviewed journal articles published in English, and sampled participants strictly from the US military and participants currently serving in the US military.

Consequently, this literature review aims to identify and source critical articles that inform the prevalence of ACE and its impacts on the adult population. The author excluded studies comprised of any published articles that reported on foreign military, articles on US veterans, and the articles that were not published using English as the standard language. Finally, a succinct matrix (see Appendix A) includes the name of the

selected peer-review article, the author (s) who published the article, the identified study population, the study's data collection procedure, interventions reported in the article, key findings revealed in the article, and the limitations of the research study.

Research Characteristics

The characteristics of the identified research studies, as shown in Appendix A, include the following: the citation, which comprised identifying the publication year; the title; and, authors of the article. This review also identified the study's location, methodology, and design as qualitative, quantitative, or mixed-methods, and explicated measurements used such as the GAD-7 for anxiety, the number of participants for each study, the variables analyzed, selection of data analysis, and key findings. Information regarding the traits of the sample population are also included in this literature evaluation. Additionally, this review includes details about the demographics of the participants, such as ethnicity, age, profession, average, and sex of the respondents.

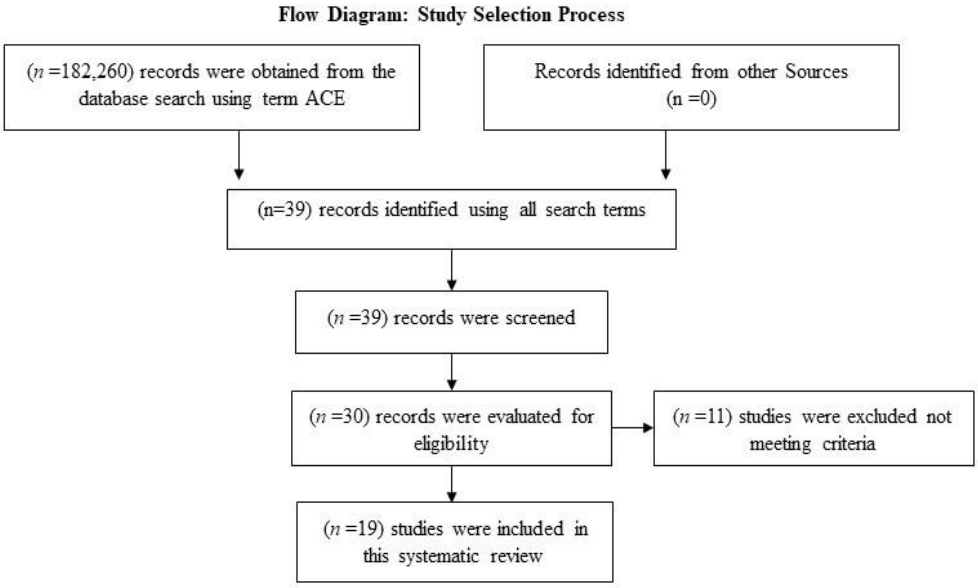
Data Synthesis and Analysis

The study findings from this literature review are presented in accordance with the PRISMA checklist, which assists in reflecting transparency and best practices to report on various literature reviews (Moher, Liberati, Tetzlaff, Altman, & Group, 2009). The discussion section of this literature review adopted a "narrative synthesis" approach in evaluating and synthesizing the identified (n=19) research publications to reveal: (1) patterns and (2) differences that exist between the individual (n=19) sources used in this literature review. Moreover, the discussion section will detail a synthesis of the preliminary study findings and an in-depth exploration of the existing relationships between the (n=19) study sources.

Summary of Article Search

The findings section provides a comprehensive diagrammatic elaboration and description of the total number of study articles that were included for analysis in this literature review. To achieve this, a matrix summary was included in this literature review. The implications for research and practice are described in the final study summary. Overall, 39 articles were screened and identified using the terms: prevalence, adverse childhood experience, childhood abuse, childhood maltreatment, military, Army, Navy, Air Force, and Marines (Figure 1). The Articles identified after initial exclusion criteria (*n*=20) articles were omitted for not meeting criteria standards. After screening, a total of 19 peer-reviewed articles remained for the synthesis of this literature review.

Figure 1: Flow-diagram for the article selection process (n=19) for the literature review



The lack of ACE data in the military derived from this literature review establishes that the prevalence of ACEs in the military remains indeterminant. Each publication provides remarkable insight, yet they lack a sufficient probability sample to determine prevalence of ACEs in the military. Females and officers were commonly under-represented in most of the studies (Applewhite et al., 2016; Cabrera et al., 2007; Clarke-Walper et al., 2014; Gahm et al., 2007; Lee et al., 2016; Young et al., 2006). This literature review identified 19 total articles for synthesis. Of those 19 articles, 42% (*n*=8)

provided a vivid and candid elaboration on the rate of ACEs in the military. Out of the identified eight articles using ACEs, 15% (*n*=3) articles have sampled a population identified from a mental health outpatient clinic, 9.5% (*n*=2) of the articles sampled respondents or soldiers returning home from deployment, and 9.5% (*n*=2) of the identified articles sampled respondents from the Navy. The remaining articles that did not utilize ACE (*n*=11) utilized other standardized, modified measures derived from the CTS, CTQ, and ALE. An aggregation from all 19 articles sampled a total of 91,837 SMs, and the range of SMs to have at least one ACE was (53-83%), and the range of SMs with four or more ACEs was (7-40%) respectively.

Articles Sampling Mental Health Outpatient Clinics

The cross-sectional quantitative article by Clarke-Walper et al., (2014) studied the following variables related to alcohol abuse and misuse: (1) combat exposure, (2) mental health challenges, and (3) ACEs. Moreover, the study's total sample consisted of (*n*=8,871) different soldiers sourced from various brigade combat teams, yet it lacked female and officer participants. The authors concluded that ACEs are a significant predictor for alcohol misuse and abuse. Moreover, 32% of the participants reported at least one ACE of having a problem drinker in the home was the most reported ACE.

Applewhite et al., (2016) also conducted a cross-sectional research design that performed a qualitative secondary data analysis on the data obtained from retrospectively reviewing the medical records of the soldiers who deployed in Afghanistan and Iraq. This research study was mainly performed based on the data obtained from the clinical health records. This study focused on reviewing a total of (*n*=162) different clinical samples. Furthermore, out of the (*n*=162) clinical samples, about 83% (*n*=135) reported having at

least one type of adverse childhood experience. The study is not generalizable due to the sample not being representative of the US military population because it lacked female and officer participants.

Gahm et al. (2007) conducted a quantitative cross-sectional research design to evaluate how the demographics contributed to the adulthood and childhood trauma on the screened depression and PTSD symptoms among the soldiers. The researchers identified a total of *n*=1,626 patient records for their analysis. The researchers reported the participants mean ACE score was 1.41 (SD=1.55) with 0 ACE as the mode. Additionally, 21% of the participants reported having at least one ACE, and 6 % reported four or more ACEs. The study was clinical, and participants were not representative to the US military population.

Soldiers Returning Home from Deployment

Conway et al. (2019) conducted a quantitative cross-sectional research design with self-administered surveys. This research mainly aimed to evaluate how sleep disturbance mediates ACE's association with functional impairments and mental health symptoms of the SMs in the US. Moreover, the researchers also collected two samples of *n*=759 and *n*=410, respectively. Soldiers completed surveys while attending the Defense Language Institute Foreign Language Center (DLIFLC) located in Monterey, CA. SMs completed self-administered surveys approximately six months post-deployment to Iraq and Afghanistan. ACE mean for sample A with younger SMs was 2.37 (SD=2.84), and the mean for sample B was 1.51(1.27). The cumulative ACE mean for bother samples was not available.

Fritch et al. (2010) conducted quantitative retrospective research using hierarchical multiple regression analysis and longitudinal research design. Moreover, the researchers aimed at evaluating adverse childhood abuse, combat trauma, and post-deployment adjustment. The researchers identified a total of *n*=1,045 activated reserve or active-duty respondents that attended the quantitative retrospective review research. The (*n*=1,045) respondents were active OEF SMs and National Guard OIF SMs.

Cabrera et al. (2007) conducted a quantitative research study to examine ACE's rate on the male soldiers deployed to Iraq and those not deployed. This study also reviewed the prevalence of the relationship between PTSD, depression, and ACE. Finally, this study evaluated the independent "predictive value" between combat exposure and ACE in the pre- and post- Iraq deployment samples. A total of 53% of respondents reported at least one ACE. Moreover, the odds ratio for SMs to screen positive for depression significantly increases as a dose-response to the number of ACEs. The OR for one ACE was 2.18, and for a SM with four or more ACEs, the OR was 6.11. Conversely, screening positive for PTSD produced similar results. SMs with one ACE had an OR of 1.38, and a SM with four or more ACEs was 5.47.

Participants Sampled from the Navy

Merrill (2004) conducted a cross-sectional research design that used questionnaires to collect data from the (n=5,491) recruits for the Navy at the Navy Recruitment Training Center from 1996 to 1997. The author (Merrill, 2004) aimed to evaluate the existing relationship between childhood exposure to household or family violence, domestic violence, child sexual abuse, and child physical abuse. The researchers reported that 55% of the respondents experienced at least one form of

childhood family violence, with 18% reporting CSA, 36% CPA, and 32% DV. The authors (Merrill et al., 1999) adopted a quantitative research design utilizing self-administered surveys. The researchers aimed at examining the effects of adverse childhood abuse on adult rape incidences. To achieve this, researchers surveyed a sample of (n=1,887) female Navy recruits. Findings indicated that 35% of women respondents reported experiencing rape before joining the service, with 57% reported a history of some type of child abuse.

Literature Review Summary

In this literature review, 19 articles speculate the prevalence of ACEs in various samples within the military. The implications of ACE indubitably affect the biopsychosocial facets of an individual to affect SMs negatively. Moreover, those health consequences frequently relegate the SM to a non-deployable status, negatively affecting the SM's wellbeing and national security.

A culminating review of the 19 articles' findings shows a range of respondents having at least one form of ACE or childhood violence or maltreatment is 53%-83%. Additionally, the range of respondents reporting four or more ACEs reported was 7%-40%. The aggregated total of SM respondents for all 19 articles equates to 91,837. Some studies reported higher scores from respondents sampled in a population with expectedly higher ACEs, e.g., an outpatient mental health clinic. Comparatively, the original ACE study analyzing the civilian, middle-class population indicated 67% reported at least one category of ACE, almost 40% reported more than two ACEs, and 12.5% reported four or more (Felitti et al., 1998).

This literature review has multiple strengths. First, multiple databases captured many articles to identify for synthesis and to meet inclusion criteria. Second, this review included a broad publication window of 22 years and various terms to capture a diverse selection of peer-reviewed journals. Limitations of this review include the lack of ACE studies representative of the general military population. To this author's knowledge, there were no ACE peer review studies sampling the US Air Force; therefore, this study's findings may not represent the US Air Force population. Currently, a limited amount of literature for synthesis is available on this emerging topic. Another limitation is that the definition of childhood trauma is not standardized across the literature, making it challenging to identify all articles relevant for this review to be synthesized for inclusion.

Most articles in this literature review utilized modified versions of the ACE questionnaire. The most common question omitted from the original version but excluded in the modified versions did not investigate if the respondent's parents were divorced. The rationale to not include such a question was not conceptualized within the articles. Implementing the divorce question still provides effectual information regarding an individual's mental health (Ainsworth, Blehar, Waters, & Wall, 2015; Yerkovich & Yerkovich, 2017; Ysasi, Silva, & Becton, 2016), and adding the question could have altered the results of the studies, thus increasing the respondent's total number of ACEs.

Supposition

This literature review synthesized 19 articles relating to ACEs and the military. This review also highlighted the negative health consequences of ACEs and how ACEs directly relate to non-deployable SMs. Of particular significance, SMs reported having more ACEs, on average, than civilian populations. Despite the literature indicating ACEs

being higher in the US military population, data from the articles reported limitations of having fewer female and officer participants not representative of the military population. Additionally, the literature has yet reported that the ACE questionnaire is being utilized as a standard protocol to identifying high-risk SMs despite its validity, feasibility, and effectiveness to identify such populations. This exploratory study addresses that void by an over-represented sample with female and officer participants.

It is imperative for future research and policy for the military to embrace and implement an ACE questionnaire to identify high-risk soldiers and offer preemptive treatment. Future studies should include a more representative sample of the military comprising of more officers, female participants, and the Air Force population. Those studies should also include the original ACE questionnaire and other related trauma questions found in this review (Conway et al., 2020).

Military healthcare professionals should conduct ACE screening as conducted by their civilian colleagues and organizations' recommendations because ACEs have a remarkable influence on an individuals' health. Screening could greatly quell the non-deployable concern and improve SMs' overall health and well-being.

Theoretical Framework and Model

One of the Army's fundamental problems with non-deployable SMs is their ability to proactively identify the SMs susceptible to mental health problems before they become non-deployable. Understanding the underlying complexities and causes of mental health conditions could very well be the antidote to assuage the US military's dilemma. First, we contextualize the lifestyle of a soldier; then, we discuss the life course health development (LCHD) model, adverse childhood experiences (ACEs), and attachment

theory concepts germane to this study to elucidate the relationship between mental illness in the military and non-deployable SMs. Only five articles in the literature review explicitly state the use of a theory, framework, or model to inform their study (Arincoryan et al., 2017; Cabrera et al., 2007; Merrill et al., 2004; Perales et al., 2012; Skopp et al., 2011). Two articles were informed by attachment theory (Aricorayan et al., 2017; Skopp et al., 2011). Lastly, a conceptual model illustrates the application of LCHD, attachment theory, and ACEs to conceptualize the determinants of non-deployable SMs followed by an analytical model illustrating what concepts will be tested in this exploratory study.

It is not uncommon for SMs to deploy multiple times, and each deployment is accompanied by numerous, mandatory, long training exercises to refine the soldier's proficiency in warfighting skills. In fact, a recent study reported over 75% of SMs that have joined since 9/11 have deployed at least once, with the Army carrying a bulk of the deployments (Wenger et al., 2018). These training and deployment events relegate a SM away from comfortable, thriving, predictable environments [their home, friends, and loved ones] into vulnerable, chaotic, austere environments [sleep deprivation, combat exposure, seclusion].

This separation from security may activate an individual's emotional, behavioral, and psychological response resulting in anxiety or depression, or manifesting in other somatoform responses (Bowlby, 1982; Doyle et al., 2009; Halfon et al., 2018; Nakazawa, 2015). The SM's *current* reaction may be a physiological "survive" response the brain acquired from *previous* childhood experiences. In fact, the human brain has evolved to detect and react to threats of neglect, abandonment, and loneliness *previously*

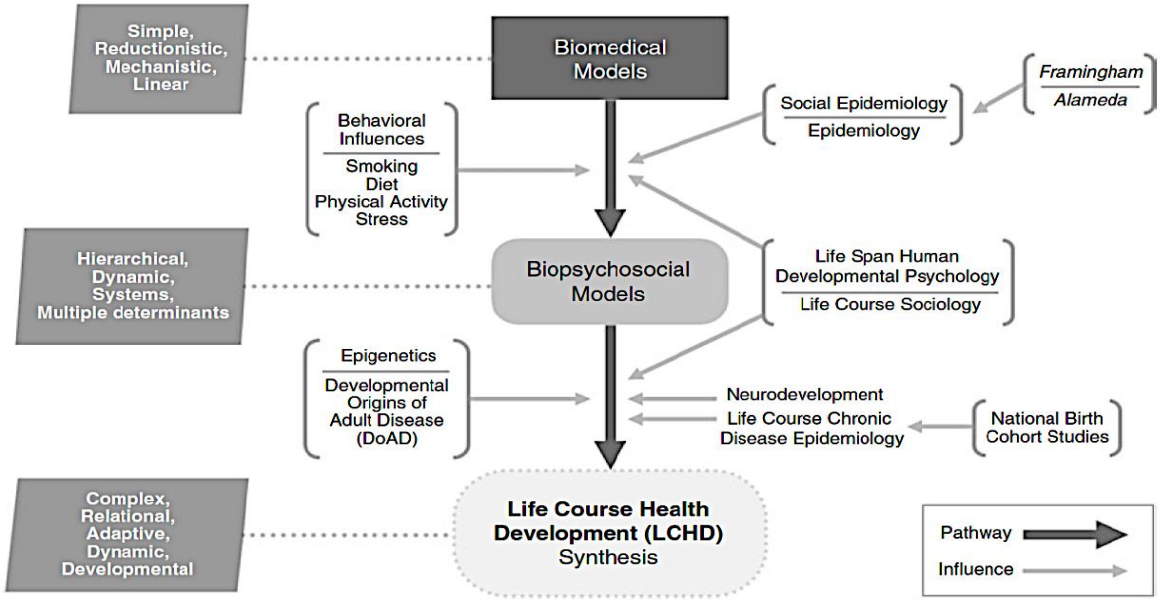
experienced during childhood and may later activate the same response in adulthood in similar situations (Eisenberger & Cole, 2012; Halfon et al., 2018; Thomas Boyce & Hertzman, 2018). This suggests that some SMs may break down and overly react differently than others physically, behaviorally, emotionally, or mentally when separated from a thriving environment to an austere one due to previous adverse experiences. In other words, the SM carries a continuation of previous developmental experiences to their current state of being. Additionally, if our brain adapted responses according to previous experiences, then this would suggest that health [behavioral, emotional, mental, and physical] is a continuum from a SM's early developmental experiences into their adulthood (Halfon et al., 2018). A mental, physical, emotional, or behavioral break down is also known as disease or health disorder (Halfon et al., 2018) and could reach a level of impairment [physically, behaviorally, emotionally, or mentally] to become clinically diagnosable. If a diagnosis is made, the SM often becomes non-deployable.

Moreover, vacillating between the two disparate environmental conditions with repeated deployments and trainings produces added stress. As far back as a decade ago, the Army chief of staff admitted that SMs are becoming worn out (Casey, 2011), which exposes SMs to an increase in their allostatic load. The repeated, chronic exposure and activation of stress leads to an increase of ones' allostatic load, or the wear and tear across multiple physiological systems becoming susceptible to many negative, chronic health disorders such as psychiatric disorders, pain, and diabetes (Halfon et al., 2018; Larson et al., 2018). It is undoubtable that SMs become ND due to the effects of a high-stress military operational environment and having a high allostatic load carried from childhood. The body will ultimately break down after so much exposure to stress.

Health is complex, non-linear, and incorporates multiple influential pathways. The LCHD model explains a SM's health "break down" and informs this study's hypothesis that adverse experiences effect health, specifically mental health. The LCHD model better describes health than other theories or models in that the others "fail to offer comprehensive explanations about such a phenomena as the developmental origins of health, how stress affects current and future health, and the consequences of dynamic interactions between individuals and their environments over time" (Halfon & Forrest, 2018, p. 1). LCHD is a transdisciplinary model that coalesces empirical evidence and scientific theories from multiple fields. Examples of the scientific fields embedded within LCHD is shown in Figure 2 and includes genetics, epigenetics, environmental health science, economics, developmental psychology, chronic disease, epidemiology, developmental neuroscience, sociology, and many more (Halfon et al., 2018).

The LCHD is a living model, meaning that it continues to develop as empirical evidence emerges (Halfon et al., 2018). The LCHD model explains how a population's and individual's health is effected from preconception (Wang et al., 2018) to death and is influenced by genes, epigenetics, environment, and social factors on multiple [micro, meso, and macro] levels (Halfon et al., 2018; Wang et al., 2018). It argues that nature *and* nurture influence causality to an individual's health trajectory. LCHD further posits that adverse experiences during critical periods of development can have profound implications later in life and well into adulthood (Halfon, et al., 2018). The current set of seven principles of LCHD describe health as an emergent set of capacities that develop continuously over a lifetime and are sensitive to critical periods in development (Halfon et al., 2018).

Figure 2: LCHD Model



Note. This figure illustrates the evolution of conceptual models of health development into its current form. Copyright 2018 by Halfon et al.

The first principle, health development, integrates the concepts of health and developmental processes into a unified concept. The two terms have long been distinctly conceptualized, yet LCHD fuses the terms into a singular construct becoming health development and is the central focus for the LCHD framework (Halfon & Forrest, 2018). It is important to define health and development and to describe how the two concepts form a mutually symbiotic relationship into a single construct.

Health can be understood has having parts and emergent properties. The parts of health are sub-systems that include dimensions of capabilities, reproduction, mind, restoration, and energetics (Forrest, 2014). The health sub-systems are an independent function, yet they are integrated as a whole, which forms emergent capacities to adapt to

environmental challenges, life goals, and enable growth of an individual for survival. For example, an individual in a stressful situation enables the limbic system to possibly release adrenalin [sub-system] while simultaneously the mind [sub-system] assesses the situation to determine if the individual [a whole] should run or fight. The sub-systems in the example work separately, yet in an integrated fashion for the survival of the individual.

In this context, development is the process by which health changes during the lifespan. These changes may include periods of growth stages, living in a dangerous neighborhood, being in a lower SES, or having a physical health impediment that causes molecular degrading, such as cancer (Halfon & Forrest, 2018). The construct of development refers to an individual's adaptations to continuously evolving social and environmental conditions (Halfon & Forrest, 2018). Health is then the "what" and development is the "how" (Halfon & Forrest, 2018, p.7). Health development is a transactional process between the individual and their internal sub-systems (hereditary genes, and organs) and external (work, family, culture, social) environments (Halfon & Forrest, 2018).

In summary of the LCHD's first principle, an individual's health development can vary depending upon both internal and external factors during the lifespan of the individual. An individual with higher SES typically has better access to medical care, eats a variety of food providing the body with proper nutrients, and lives in a safer neighborhood. A person's trajectory of health development over their lifespan will thrive better compared to an individual with lower SES. Individuals with lower SES typically have less access to medical care, eat less than optimal foods deficient in nutrients —

effecting internal organ [sub]systems and becoming susceptible to diseases such as obesity, diabetes, and depression, — and live in more dangerous neighborhoods (Halfon et al., 2018; Thomas Boyce & Hertzman, 2018). The two disparate examples depict how internal and external environments effect health development. The individual with higher SES thrives while the individual with lower SES survives.

Unfolding is the second principle of the LCHD model. The unfolding principle suggests that health is not static, non-linear, nor a passive process, but that genes are expressed and unfold in an ordered, coherent pattern by what has worked before. Unfolding is the process in which "health development occurs continuously over the lifespan, from [pre]conception to death, and is shaped by prior experiences and environmental interactions…is adaptive, self-organizing, and autocatalytic" (Halfon & Forrest, 2018, p.10).

Self-organizing means that molecular structures express, emerge, and regulate by sensing and signaling differences by variations to fit the present environment. Health development shapes and is shaped by environmental circumstances. Autocatalytic is a reaction of another product's reaction and acts as a catalyst or fuel that propels the product forward (Halfon & Forrest, 2018). The adaptive, self-organizing, and autocatalytic concepts explain how genes [nature] and culture [nurture] coevolve as individuals evolve. As humans evolve in practices, information, habits, and behaviors, the new adaptions of the human experience feed forward [autocatalytic] to regulate gene expression through epigenetic changes during phases of the lifespan. This process relegates genes to improve and express or optimally regulate to acquire, store, and organize to survive and thrive (Halfon & Forrest, 2018).

LCHD suggests that health development is complex and hierarchically arranged, thus presenting the third principle of complexity. Halfon and Forrest (2018) said, “Health development results from adaptive, multilevel, and reciprocal relations between individuals and their physical, natural, and social environments” (p.13). Phenotypes of health development cannot be understood from a simplistic, traditional, biomedical reductionist theory. Instead, there are many pathways, agents, directions, and channels that health development can take. It is not deterministic, and relationships at the molecular, social, ecological, and natural systems are independent and interdependent of each other. One small change in any one of those systems can profoundly influence another system in a non-linear process (Halfon & Forrest, 2018). These changes can influence the trajectory depending on *when* the changes occur.

The *when* leads to the fourth principle of the LCHD model of timing: “Health development is sensitive to the timing and social structuring of environmental exposures and experiences” (Halfon & Forrest, 2018, p.18). Health development results from interactions to exposures from environmental stimuli or internalized experiences that are time-specific and time-dependent. Childhood is an example of time-specific and time-dependent influence. Childhood is a stage of life when the nurturing and health development of children is greatly influenced by biological and behavioral systems as well as environmental and social experiences. Individuals are sensitive at this stage of life (Halfon & Forrest, 2018). This would suggest that the duration, the role, relative dose, protective, and promoting factors during each stage of development from preconception to death all influence the trajectories of an individual’s health development (Hanson & Gluckman, 2014). The disparate lifestyles between the levels of SES are an example how

health development trajectories can differ among individuals and populations supporting the timing concept. Timing highlights the importance of sensitive nurturing during the foundational childhood developmental stages; and if a lack of sensitivity or neglect occurs, the negative physical and mental implications can be profound (Beeney et al., 2019; Conti & Heckman, 2013; Felitti et al., 1998; Grajewski & Dragan, 2020; Halfon & Forrest, 2018; Li et al., 2020; Murphy et al., 2014; Sedighimornani et al., 2020; Sheinbaum et al., 2015; Tamman et al., 2019; Theisen et al., 2018). Indeed, the timing concept is influential, but it is not deterministic.

Health development is responsive to the transactions between the different environments and is malleable, enabled, and constrained to enhance adaptability to diverse environments (Halfon & Forrest, 2018). This adaptability [plasticity] is the fifth principle of the LCHD model. Signals from endogenous [internal] and exogenous [external] dimensions attempt to predict future circumstances by selecting or not selecting certain genes and behaviors to be expressed or regulated. Plasticity can manifest at different levels depending on the endogenous and exogenous cues. Environmental plasticity may influence social plasticity, social plasticity may influence behavioral plasticity, and "behavioral plasticity may be influenced by neural plasticity, and neutral plasticity may in turn be influenced by molecular plasticity influenced by epigenetic mechanisms" (Halfon & Forrest, 2018, p.16). This plasticity allows for an individual to survive for optimized outcomes to also enhance well-being and protect against diseases. Such ideal conditions allow an individual to thrive (Halfon & Forrest, 2018).

The sixth principle suggests that individuals and populations are capable to thrive. Health development phenotypes enable individuals and populations to pursue desired

objectives and live a long flourishing life (Halfon & Forrest, 2018). Health development is considered optimal if the level of the phenotypes improves the chances to survive. However, suboptimal conditions lead to break down and fully formed disorders or disease. The suboptimal state can be attributed to unpredictable environments. For example, a child in a chronically stressful environment during sensitive stages of neural development can have altered brain development and functional development of attachment relationships (Beeney et al., 2019; Halfon & Forrest, 2018; Tamman et al., 2019). The phenotypic characteristics of poor impulse control, anxious attachment, and a hyperactive stress response further impact health behaviors and mental health (Halfon & Forrest, 2018).

Health development "provides a set of resources that organisms draw on in order to pursue goals, such as surviving, achieving a state of physical robustness and resilience, and psychological flourishing"(Forrest, 2014; Halfon & Forrest, 2018). Interestingly, the LCHD model acknowledges throughout that the quality of attachment relationships bears an influential role in the capacity for an individual to thrive. Attachment also plays a critical role across all LCHD principles as well. The role of attachment relationships will be specifically addressed later.

The last principle of the LCHD model is harmony. Health development results from a balanced, coherent, relationship among evolutional, cultural, behavioral, physical, and molecular processes (Halfon & Forrest, 2018). A harmonious synchronization of these factors influences the variability of health development; therefore, a loss in coordination of these factors results in suboptimal negative health development

consequences, and a harmonious coordination promotes thriving and flourishing mentally and physically (Halfon & Forrest, 2018).

A recurring theme in the LCHD seven principles emphasizes how the social, behavioral, and biological environments influence health development. Adverse social and environmental experiences, particularly, give relevance to this study as they are the cause for negative health consequences physically and mentally. Having this knowledge supports one explanation of how SMs become non-deployable due to mental health impediments. The topic of adverse social and environmental experiences is an expansive topic that warrants further explanation.

Adverse Experiences During Childhood

Understanding the causes of non-deployability is multifactorial, and it is essential to examine the formative circumstances of an individual to accentuate further the underpinnings of mental health. We have previously established how the LCHD model explains health development. Moreover, the LCHD repeatedly states that adverse experiences greatly alter the trajectory of an individual's health negatively (Halfon & Forrest, 2018). Authors of the LCHD emphasize early experiences of divorce, alcoholism of a family member, or all the typologies of abuse are detrimental to health development and are the leading cause of illness and death (Halfon & Forrest, 2018). However, the topic of childhood adverse events and child maltreatment and their effects has been only superficially discussed and requires further attention.

Children exposed to adverse events are helpless to their circumstances and are at an increased risk of developing adverse health outcomes that include addiction and insecure attachments (Grajewski & Dragan, 2020; Sedighimornani et al., 2020; Wood et

al., 2018) and developing physical ailments and mental illness (Bakalar et al., 2018; Bucci et al., 2015; Burke Harris et al., 2017; Felitti et al., 1998; Kalmakis & Chandler, 2015). These adverse events include all typologies of abuse, neglect, household dysfunction, divorce (Felitti et al., 1998), loss of a loved one (Bowlby, 1982), moving away from home (Alsubaie et al., 2019), bullying (American Psychiatric Association, 2013), losing a cherished pet (Messam & Hart, 2019), or living in a dangerous neighborhood (Jackson et al., 2019; Thomas Boyce & Hertzman, 2018). Childhood maltreatment and trauma are most significantly associated with developing negative physical, emotional, mental, and behavioral impediments (Fresno et al., 2018).

Child maltreatment includes all the typologies of child abuse and child neglect. Researchers Barnhart and Maguire-Jack (2016) provide the federal definition of child abuse and child neglect per guidelines set forth by the Child Abuse Prevention and Treatment Act (CAPTA), amended in 2010. It states,

> Any recent act or failure to act on the part of a parent or caretaker which results in death, serious physical or emotional harm, sexual abuse or exploitation; or an act or failure to act, which presents an imminent risk of serious harm. (p.1)

This definition provides a broad range of circumstances that a child may experience during their formative years and fall victim to biological and mental impairments in adulthood. Household dysfunction exacerbates the problem of child maltreatment pervasiveness when coupled with child abuse and neglect. Child maltreatment is too common and prevalent in today's households. In fact, 60% of children globally experience these deplorable adverse experiences (Felitti et al., 1998; Sethi et al., 2013; Wiehn et al., 2018). Vincent Felitti, MD, coined the term when referring to these experiences as *Adverse Childhood Experiences* (ACEs).

Felitti (1998) conceptualized and constructed a questionnaire to elicit an individual's formative experiences from age 0-18. The questions are constructed around all typologies of abuse and household dysfunction. Felitti teamed up with Robert Anda, MD, and the Center for Disease and Control (CDC) to explore the prevalence of ACE in the general population. As mentioned earlier, the study's results were profound: 67% reported at least one category of ACE, almost 40% reported more than two ACEs, and 12.5% reported four or more (Felitti et al., 1998). Since Felitti's seminal study, researchers have explored the prevalence of ACEs in specific populations. One such study explored the prevalence of ACEs in the Army with 83% of their sample having at least one ACE (Applewhite et al., 2016). Additionally, the number of ACEs an individual experienced has a dose-response relationship to multiple diseases and behavioral outcomes. The more ACEs an individual has, the more likely they are to have increased negative health outcomes (Anda et al., 2009). High risk (HR) individuals are individuals with multiple ACEs, and they are susceptible to the seven of out 10 leading causes of death due to the dose-response relationship (Bellis et al., 2019; Felitti et al., 1998).

In sum, ACEs are a prominent force that can cause insecure attachments and biological, mental, behavioral, and emotional impairments. ACEs fracture an attachment and break the bond of trust (Murphy et al., 2014). Individuals with ACEs and an insecure attachment harbor feeling of shame, guilt, abandonment, and an impression of being unloved or unwanted (Murphy et al., 2014; Sedighimornani et al., 2020). An individual harboring those feelings will seek solace in forms of substance and behavioral addictions and other self-defeating behaviors (Grajewski & Dragan, 2020; Li et al., 2020; Marshall et al., 2018; Yerkovich & Yerkovich, 2017). When an attachment is fractured, the

resulting effects are typically anxiety, depression, or other forms of mental illness causing great impairment and distress (Bowlby, 1973; Bowlby, 1980; Bucci et al., 2015; FacomprÉ et al., 2018; Levine & Heller, 2012; Yerkovich & Yerkovich, 2017).

LCHD and Attachment

Another recurring theme in the LCHD model besides adverse experiences is the emphasis on attachment relationships (Halfon & Forrest, 2018). The LCHD model stresses the importance of early relationships formulated in all stages of childhood. It is argued that no other developmental stage, other than infancy, experiences dynamic and complex changes on an individual to their personal, social, emotional, and neuroanatomical development more than emerging adults (EA) (Halfon et al., 2018; Wood et al., 2018). Individuals in the EA stage are ages 17 to late twenties. Coincidentally, EA is the same age bracket the military primarily recruits from (Woodruff et al., 2006) and consists of many of the non-deployable SMs (Cronrath et al., 2017). This stage of development requires substantial support to navigate the transition from EA to adulthood, and having stable, reliable relationships [attachments] influences the LCHD (Wood et al., 2018). Authors of the LCHD present evidence that the foundations of attachment may commence as early as in-utero and that suboptimal or inattentive parenting during childhood formulates negative attachments (Halfon et al., 2018; Wang et al., 2018)

The LCHD model discusses the relationship between mother and child; however, it is well established that a child can have an attachment relationship other than with maternal caregivers (Bowlby, 1969; McClelland et al., 2018; Theisen et al., 2018). Disruptions in the caregiver relationship during early development effects future

relationships. For example, divorce is very common in society, and the consequences have negative effects and influences an EA's ability to form future, stable, romantic relationships (Halfon et al., 2018). Poor parenting also has detrimental and significant effects on children to self-regulate and have a secure attachment, thus increasing their susceptibility to mental health disorders (Girme et al., 2020; McClelland et al., 2018; Valikhani et al., 2018).

Attachment is fostered from caregivers in homes or other domiciles during the child's upbringing. The domicile is where the primary transactions of social, cultural, behavioral, biological, and environmental experiences advance or regress. The home sets the tone and stage as an individual attempts to prepare and predict for future survival. Knowing that [attachment] relationships is a critical element to LCHD, it is therefore important to know the complexities of attachment theory and how it relates to SMs and how attachment affects mental health.

Separation during deployment or training may cause a SM to reexperience patterns of relationship events established during childhood (Basham, 2008; Thomas Boyce & Hertzman, 2018; Ysasi et al., 2016). By default, humans are social creatures and yearn to feel loved and have close meaningful relationships (Bowlby, 1977; Siegel & Bryson, 2012; Yerkovich & Yerkovich, 2017). This longing for meaningful relationships, coupled with extended separation due to training and deployments, can easily impair any SM mentally. The impairment can become exacerbated if the SM has a history of tenuous relationships dating back to their childhood. They may have feelings of fear of separation and abandonment and lose their relationships. This fear occurs when a person's current

relationship is triggered by a disturbing implicit memory during childhood (Grégoire et al., 2020).

It is crucial that SMs remain mentally astute and keenly aware of their surroundings. If a SM's response to a relationship separation becomes too impairing, they may put themselves or others at risk during training or deployment. For example, a SM may become preoccupied with a text he received from his partner back home while simultaneously guarding a tower. A SM's mental distraction could result in a suicide attacker to enter a military location unnoticed and harm other SMs. Thus, the SM was cognitively and emotionally impaired to perform duties and put himself and others at risk from the potential assailant. It is understandable, given the context, why the DoD allocates many resources to identify SMs who are at high risk of psychological impairment and deployment eligibility. If a SM becomes ineligible to deploy, they are deemed non-deployable. SMs identified with a mental impairment by medical professionals are classified as non-deployable because the SM reached a threshold of incapacitation to perform required duties (Cronrath et al., 2017).

Attachment Theory Concepts

John Bowlby was a British psychiatrist and psychologist distinguished for his pioneering work with children. Through rigorous research, he established the underpinnings of attachment theory by describing the emotional bond a child acquires with their caregiver during formative years. Attachment theory was founded on the underpinnings of ethological and evolutionary theory (Bowlby, 1969). Bowlby observed how infants separated from their caregiver varied in their demand — sometimes desperate — to be more proximal to their caregiver. Bowlby argued these responses are

"instinctive" and "goal-directed" behaviors; these behaviors include clinging, crying, biting, smiling, and constantly searching for their missing caregiver to return (Bowlby, 1969, pp. 54-56). These experiences provide a foundation for future adult relationships. Thus, attachment theory posits that experiences during our formative years are a representation of how we will view relationships in adulthood. Attachment systems become fortified or tenuous contingent upon the caregiver creating a safe haven. A safe haven is established through attentive, consistent, predictable, and accessible parents that address the infant's needs (Bowlby, 1969).

Bowlby postulated that those instinctual responses serve a purposeful goal to satisfying the distressed child's physical and emotional needs. Additionally, Bowlby suggested that infants become increasingly creative and innovative to attract a caregiver's attention to fulfill needs, thus creating an attachment system (Bowlby, 1969). If the caregiver is attentive as described, the child's confidence is bolstered, they feel secured, loved, protected, and the child self-soothes more easily. This added confidence fosters a proximal and secure base, which allows the child to increase their social skills. The child will venture and explore farther away from their caregiver when confident, and they can return if comfort is warranted. This confidence also enables the child to build social skills to focus on playing while knowing the caregiver is near (Bowlby, 1988). However, if the caregiver is inattentive, inconsistent, unpredictable, and inaccessible, the child will increase their fear of losing their safe haven. A child manifests anxiety or depression due to insensitivity towards a child's needs. Thus, deviant behavior (pushing and fighting) and personality disorders can develop (Bowlby, 1980). Through Bowlby's observations, he reported discernable differences in each individual's attachment.

The child may have an attachment to the mother and not the father, and vice versa, have an attachment to both parents, or they may not have an attachment to either parent. Ainsworth was a protégé of Bowlby and elevated her contributions to attachment theory by providing empirical research relating to how attachment is expressed in other cultures (Ainsworth, 1967). Ainsworth is renowned for systematically categorizing the differing styles of attachment. Ainsworth and her students developed an experiment called the *strange situation* to analyze how children react when separated from their caregivers. Ainsworth observed the patterns of the children and categorized the patterns to differing attachment styles. The attachment styles are classified as secure attachment, anxious-resistant attachment, anxious-avoidant attachment, and disorganized attachment (Ainsworth et al., 2015). These attachment styles are described more in-depth below.

Secure Attachment

A securely attached child feels protected by the caregiver and becomes easily soothed when upset. Moreover, the secure child is confident that the caregiver will be attentive, sensitive, and responsive in times of need. With those assurances, the child feels emboldened to confidently explore farther away from their caregiver, knowing they can return to safety. In a strange situation, a secure child is visibly upset when the caregiver leaves, but positive, happy, and easily soothed only by the caregiver's return (Ainsworth & Bell, 1970; Bowlby, 1988).

Levine and Heller (2012) stated that adults with a secure attachment are more mentally flexible, and they are self-assured being alone when not in a relationship. Adults with an insecure attachment tend to become uneasy, anxious, and irritable. The adult feels reassured and comfortable with themselves when separated from their partner or children.

Securely attached adults know how to say “no” and set healthy boundaries with others, such as co-workers and friends. They do not expect perfection from others, knowing that everyone has strengths and weaknesses. Adults with a secure attachment also have a higher level of tolerance and patience and they do not expect perfection from others, which allows them to excel as communicators. Securely attached adults successfully maintain relationships domestically, occupationally, and socially compared to insecurely attached adults (Levine & Heller, 2012; Yerkovich & Yerkovich, 2017). A majority of children and adults, 60-70% of the population, are securely attached (Ainsworth et al., 2015; Levine & Heller, 2012; Yerkovich & Yerkovich, 2017).

Anxious-Resistant Attachment

Inconsistent parenting is the determinant for the anxious-resistant attachment style. Children with an anxious-resistant attachment constitute almost half of all insecure attachment styles. The prevalence of this style is estimated to be 15-20% of the population. These children are uncertain whether or not their caregiver will be attentive, sensitive, and responsive. In a strange situation, a child is distraught when the caregiver leaves, and when the caregiver returns, the child approaches the caregiver but is ambivalent when the caregiver returns. The child may push the caregiver away, yet the child will pull the caregiver back tightly in fear of being separated again. The child is confused and creates an ambivalence in the child’s confidence to explore; thus, separation anxiety forms. The child is left wondering if and when their caregiver will attend to their needs. Parents and outside observers will see children with an anxious-resistant attachment as needy and not easily soothed. The behaviors of anxious-resistant

children become promoted when the caregiver is inconsistent in meeting the demands of their child (Ainsworth & Bell, 1970; Bowlby, 1988).

Adults with an anxious-resistant attachment style may express their insecurities in many forms. The typical behavior of the anxious-resistant style is to please others stating, "they play the role of the 'good boy' or 'good girl' in an attempt to gain the approval of or recognition and to reduce tension in [a relationship] by pleasing rather than causing problems" (Yerkovich & Yerkovich, 2017, p. 72). The adult learned to avoid criticisms as a mode of protection and "the underlying motivation for being in the helping role and focusing on the needs of others is to reduce one's anxiety by keeping people close, content, and satisfied" (Yerkovich & Yerkovich, 2017, p. 72). Anxious-resistant adults feel lost when they are isolated. They are left wondering when their significant other will return. They panic internally, and in frantic efforts, they will text message to console feelings of fear or jealousy by locating their loved one, or they call to plead for solace and personal reassurances (Levine & Heller, 2012; Yerkovich & Yerkovich, 2017).

Anxious-Avoidant Attachment

In addition to anxious-resistant, the other half of insecure attachments styles are the anxious-avoidant type. Adults and children with anxious-avoidant attachment comprise 15-20% of the population. Children with this attachment are confident their needs will not be met regardless of communicating demands of needs. The caregiver rejects, ignores, shuns, rebuffs, and leaves a child to their own devices for comfort. Paradoxically, the child will maintain certain proximity for protection, yet positioned far enough away to avoid being rebuffed. In *the strange situation* experiment by Ainsworth, the child exhibits little to no distress when their caregiver leaves, and when the caregiver

returns, the child shows little interest in the caregiver. Interestingly, the caregiver and the stranger are equally able to soothe the child when distressed (Ainsworth & Bell, 1970; Bowlby, 1988).

Adults with an anxious-avoidant attachment are well known for their independence, but it is to their own demise. They become hyper-independent and are uncomfortable with intimacy and vulnerability. Yerkovich and Yerkovich (2017) said, "although self-sufficiency is admirable when it hides pain, it chokes the life out of a relationship" (p. 57). Being hyper-independent enables them to avoid feeling uncomfortable, being seen as weak or needy, or experiencing closeness. However, they are obsessed with finding "the one and only" that enables them to remain hyper-independent. Generally, anger is the most commonly expressed emotion to mask other, more vulnerable feelings. Additionally, co-workers or acquaintances label anxious-avoiders as being overly critical and rigid (Levine & Heller, 2012; Yerkovich & Yerkovich, 2017).

Disorganized Attachment

The prevalence of disorganized attachment is <5% but may vary depending on socioeconomic status (SES) and is the most extreme attachment style (Cavanagh & Fomby, 2019). Ainsworth's colleague, Mary Main, identified several children displaying contradicting behaviors other than those described in other attachment styles. Some of the children would freeze, make jerking movements, or dissociate with a gaze at the presence of a stranger. They were flooded with fear and displayed irregular, unpredictable patterns of behavior. They did not have an organized method to deal with a stranger (Main & Solomon, 1990). This attachment style derives from an abusive home. The abuse may

come in the form of physical, emotional, or sexual abuse and include neglect. The child vacillates from loving the caregiver, yet the child learns to fear the caregiver as well (Main & Solomon, 1990).

Adults with a detached attachment will act erratic, unpredictable, and with confusing or contradicting behavior. They are insensitive and explosive. They have a very difficult time self-soothing. Those with disorganized attachment self-soothe negatively, which impacts their professional and social lives. A life of chaos and maltreatment becomes the norm because of the abusive home environment in which they grew up. These adults have a difficult time narrating their childhood with amnesic recollection. Yerkovich and Yerkovich (2017) stated that adults with this attachment style are often controlling to their partner or children, or they find themselves becoming the victim again, recreating the cycle of violence.

To be concise, the above attachment styles will be conceptualized as either secure or insecure unless otherwise specified. Thus far, the theoretical section briefly described adult attachment styles and their accompanying caregiving experiences and behavioral manifestations. An adult's childhood experiences significantly impact and further influence the individual's attachment style. To explain the origins of attachment styles, one needs to understand the central tenets of attachments that influence each attachment. These central tenets are a safe haven, secure base, proximity maintenance, and separation distress.

Safe Haven

Bowlby (1967) suggests that an infant begins to learn about who their caregiver is from inside the womb. This notion posits that the inception of one's attachment occurs

prenatally. Moreover, researchers present evidence how the foundations of a disorganized attachment are associated with the poor mental health of the mother while the baby is still in the womb, supporting Bowlby's premise. The researchers suggest that more exploration is needed to be more conclusive, but the evidence is nevertheless alarming (Flowers, McGillivray, Galbally, & Lewis, 2018). From birth, the infant, and later the child, develop a sense of protection and security contingent upon the responsiveness, attentiveness, and consistency of the caregiver.

Quality care is critical during the first year of the infant's development. If the baby feels threatened, afraid, or in danger, the baby seeks solace from the caregiver (Ainsworth & Bell, 1970). Bowlby also said, "to remain within easy access of a familiar individual known to be willing and able to come to our aid in an emergency is clearly a good insurance policy-whatever our age" (Bowlby, 1988, p.27). If the caregiver responds quickly to soothe the fear, the infant feels safe and secure with a reliable caregiver. The child will then develop the foundations of a secure attachment. If the caregiver is inconsistent, negligent, or when the expected source of solace becomes associated as a threat, the quality of care diminishes, and the child will likely develop an insecure attachment (Ainsworth, 1967). The experiences of an infant during the safe haven phase directly influence the following concepts of separation distress, proximity maintenance, and secure base.

Separation Distress

Infants manifest their nascent attachment style if they become distressed when separated from their caregiver. Distress is natural (Bowlby, 1988). How sensitive the caregiver is to respond to the distress influences the infant's attachment style. For

instance, if the baby cries from hunger, does the caregiver pull the infant close to feed? Or is the caregiver distant and rigid while feeding out of obligation and inconvenience? The infant also understands the tone of voice of the responding caregiver. Is the tone calm and reassuring, or is it anxious and rigid? A secure child can be soothed merely by the sound of a caregiver's calming voice, yet an insecure infant will display a higher level of distress upon hearing a more anxious voice (Bowlby, 1988). Adults also display separation distress. SMs experience separation from their safe haven on a routine basis. Pictures and videos on the news depict SMs and their dependents tearfully saying goodbye when the SM departs for deployment. The level of distress, when separated, is significantly unique to each individual and attachment style.

Proximity Maintenance

Children are innately curious and inquisitive about the new world. Becoming more mobile enables the child to discover this new world. However, the distance the infant travels away from the caregiver is contingent upon the infant's foundational experiences of their met needs (Ainsworth, 1970; Bowlby, 1969, 1988). Just as Bowlby observed in primal baby mammals, when a child begins to wander, a polarizing, internal conflict arises within the exploring child. The child determines the safest distance to explore while remaining relatively close to the caregiver for protection (Bowlby, 1973).

A secure child will venture farther and farther, building confidence that the caregiver will be readily available. Nevertheless, an insecure child will fear the caregiver will not be available, leaving the child anxious to retreat to their safe haven or follow exploratory instincts. The child will be hesitant to ask for demands if rebuffed by the caregiver. They will not know which caregiver they will face: a loving, comforting

caregiver, or an unresponsive, cold, and rigid caregiver**.** The experiences in proximity maintenance and the internal conflict will follow the individual into adulthood. A SM might bring transitional objects (Litt, 1986) such as pictures of family or household pillows to feel closer to home while they are away on deployment. Too, a SM might write letters, send text messages, or make video call as efforts to feel more proximal to home.

Secure Base

As mentioned previously, a child's behavior to remain within easy access of demands depends on the consistency and quality of responsiveness and attentiveness from the caregiver (Ainsworth et al., 2015; Bowlby, 1988; Levine & Heller, 2012; Yerkovich & Yerkovich, 2017). A secure child that is confident their caregiver is proximal and consistently available will explore farther and farther away as a toddler, adolescent, and adult. The secure teenager can be soothed simply by hearing the voice of their caregiver from a simple phone call, or as an adult calling their responsive partner for comfort. An anxious-resistant adult will become clingy, exceedingly distressed, or reluctant to be away from a caregiver. The anxious-avoidant adult will ignore their partner leaving, though internally feel distressed, and the disorganized adult may be angry or pleading in desperation for their partner not to abandon them (Ainsworth et al., 2015; Yerkovich & Yerkovich, 2017).

These formative experiences are ingrained interpersonally and form into implicit and explicit memories while establishing mental illustrations for future relationships (Bowlby, 1980; Grégoire et al., 2020; Nakazawa, 2015; Siegel & Bryson, 2012). And, as mentioned previously, the brain has evolved to detect and react to threats of neglect, abandonment, and loneliness from earlier life course experiences that may

later activate the same response to similar situations in adulthood (Eisenberger & Cole, 2012; Halfon et al., 2018; Thomas Boyce & Hertzman, 2018). Essentially, an individual speculates how well they can trust an individual, whether intimately, socially, or occupationally from these previous experiences. If the adult is secure, they will respond open-mindedly to new relationships. The insecure adult is guarded or impetuously frantic to new relationships. Bowlby (1988) said it best:

> As an individual grows older his life continues to be organized in the same kind of way, though his excursions become steadily longer both in time and space. On entering school, they will last for hours and later for days. During adolescence they may last for weeks or months, and new attachment figures are likely to be sought. Throughout adult life the availability of a responsive attachment figure remains the source of a person's feeling secure. All of us, from the cradle to the grave, are happiest when life is organized as a series of excursions, long or short, from the secure base provided by our attachment figure(s). (p.61)

Contextually, SMs in general prefer a secure, predictable, stable lifestyle and environment; however, deployments and long training exercises are converse to those preferences.

Non-Human Attachment

Bowlby's watershed work has propelled advancements of attachment theory by other researchers to explore how individuals possess attachments to non-human, organizational, and other types of relationships. These relationships include, but are not limited to animals (Carr & Rockett, 2017), teammates (Yip et al., 2018), sororities and fraternities (Estrada et al., 2017), co-workers (Yip et al., 2018), friends (Doyle et al., 2009), and members of a military unit (Negin, 2002; Shay, 2003). These examples illustrate the breadth and depth that individuals are willing to connect and attach themselves emotionally. It is not uncommon to see passengers on an airplane with an

emotional support animal, or an individual regarding an organization such as a team or fellow SMs in a military unit as a family. They have formed a non-human attachment on the premise of fostering a relationship through trust and vulnerability. Individuals with a deficient formative experience are not solely the individuals yearning for emotional connections to non-human objects. Even secure individuals can foster a non-human relationship such as welcoming a puppy into the home. As mentioned earlier, SMs may bring transitional objects from home to remind them of their treasured relationships they left behind.

In sum, formative attachment styles are influenced during earlier developmental experiences and the quality of availability, attentiveness, responsiveness, and consistency perceived by the child from their caregiver. The LCHD's emphasis on the importance of relationship's influence on health confirms the imperative necessity to detail the specifics of attachment. A quality experience of safe haven, separation distress, proximity maintenance, and secure base are the keystones to a secure attachment. An individual might formulate an insecure attachment if one of these keystones becomes too unstable and tenuous. Moreover, an insecure attachment is created in a child when adversity or trauma is suffered and not assuaged by the caregiver. Alternatively, chronic experiences such as abuse, neglect, or household dysfunction produce the same insecure attachment styles and distress (Ainsworth et al., 2015; Bowlby, 1988; Cavanagh & Fomby, 2019; Levine & Heller, 2012; Nakazawa, 2015; Yerkovich & Yerkovich, 2017) and thus increase their susceptibility to develop mental health impediments (Halfon et al., 2018).

Conceptual Framework

Impaired distress

The Diagnostical and Statistical Manual of Mental Disorders (DSM-5, 2013) is a commonly accepted manual used by clinicians to diagnose mental disorders. A diagnosable mental health disorder is contingent upon the level of impairment and symptoms an individual exhibits (American Psychiatric Association, 2013). It is not exceptional for an individual to feel heartbroken after a breakup or losing a loved one. They will potentially feel depressed, angry, lonely, or a myriad of other distressful feelings. However, if the individual develops a certain criterion per the DSM-5, a mental health disorder diagnosis is warranted. This criterion may include suicidality and various types of impairment: social, interpersonal, leisure, occupational, cognitive, or diminished activities of daily living (American Psychiatric Association, 2013).

The DSM-5 is a manual that assists health practitioners in diagnosing mental disorders. These mental disorders traverse all human races, gender, ages, and SES. Nonetheless, it is important to highlight that a significant portion of the DSM-5 focuses on personality disorders, which are associated with insecure attachments (Beeney et al., 2019; Bowlby, 1988; Willmot & Evershed, 2018). Moreover, the DSM-5 provides a section on reactive attachment disorder, a disorder typical in an individual with a history of maltreatment (American Psychiatric Association, 2013). The inclusion of these disorders indicates the influence of insecure attachment to a person's wellbeing.

SMs too often experience the impairments listed above due to the operational tempo and environment in which they abide (Applewhite et al., 2016; Basham, 2008). For example, if a SM is about to deploy or leave for a long training exercise, the SM's implicit memory will activate destructive behaviors and emotions learned from their

adverse, unresolved, past experiences. These behaviors and emotions may include anxious and desperate attempts by the SM to convince leadership they do not need to attend training. Failed attempts may lead the SM to feel depressed and report thoughts of suicide. This example is not a hypothetical scenario. It is a reality. A recent study discovered many SMs reported having pre-existing [unresolved] symptoms of mental health disorders prior to joining the service (Applewhite et al., 2016; Nock et al., 2014; Shay, 2003).

As mentioned previously, researchers (Bucci et al., 2015) suggest that 73.6% to 90.5% of mental health patients with either mild or chronic conditions have an insecure attachment style. Adults with an insecure attachment style experience higher forms of depression, anxiety, and physical symptoms like stomach aches, headaches, and chronic pain compared to those with secure attachments. Moreover, individuals with avoidant and disorganized attachments commonly report various forms of addiction (Marshall et al., 2018; Yerkovich & Yerkovich, 2017). SMs with the reported conditions listed above, specifically suicide ideation, have difficulty adjusting to the demands of the military; thus, they become non-deployable and strain a unit's fighting capability (Curley & Warner, 2017; Stanley & Larsen, 2019).

Non-deployability

SMs with an impaired mental health condition are unable to deploy (Arnold et al., 2011; Cronrath et al., 2017; Curley & Warner, 2017). The US Central Command (CENTCOM) medical providers and other expert consultants dictate guidelines that deem a SM unfit to deploy to the Middle East. Other regional commands follow similar medical guidelines crafted by CENTCOM for SMs to deploy to their specific regions. The CENTCOM guidelines are called the Modification of the Operation Order (MOD). Medical personnel in military units preparing to deploy follow the current MOD guidelines. The medical personnel assess each SM's medical record for physical ailments, mental health disorders, or behavioral disorders that may inhibit the SM's ability to perform their duties in an austere, foreign environment. As mentioned earlier, the number of non-deployable SMs affects national security (Arnold et al., 2011).

Copp (2018) reported that out of 2.1 million SMs currently in the service, 11% or 235,00 were deemed non-deployable. More specifically, Arnold et al. (2011) indicated, over 75,000 US Army SMs are non-deployable, representing 13% of the total Army SM population. Mental illness is attributed as a main cause of the drastic increase in non-deployable SMs, and thus far, no effective method exists in the military to identify HR SMs and reduce the mounting non-deployable numbers (Arnold et al. 2011).

ACE questionnaire utilized to identify high risk SMs.

As mentioned above, an increasingly large body of literature highlighted the prodigious association between ACEs individuals' negative health outcomes well into adulthood. On this premise of association, it is imperative HR individuals are identified

as early as possible to begin the process of treatment and healing (Burke Harris et al., 2017; Felitti, 2017; Nakazawa, 2015).

Early screening is central to the effective management of trauma suffered by individuals. The utility of the ACE questionnaire remained indeterminate until the questionnaire became a screening instrument for civilian healthcare clinicians (Burke-Harris, 2017). The questionnaire has been through rigorous testing for reliability and internal and external validity (Dube et al., 2004; Pinto et al., 2014) to prove its efficacy in identifying vulnerable, HR individuals and populations. In fact, the AAP, CDC, SAMHSA, WHO, and other organizations recommend the use of the ACE questionnaire as a practice for prevention of mental health impediments to screen and identify for HR populations (Alcalá et al., 2017; Burke Harris et al., 2017; Kerker et al., 2016).

Those identified as HR can be referred for treatment preemptively to promote resilience and reverse ACE's adverse effects. Moreover, utilizing the ACE questionnaire as a screening instrument is mutually beneficial: it is feasible for health care clinicians and acceptable by patients (Burke Harris et al., 2017; Conn et al., 2018; Felitti, 2017; Flanagan et al., 2018; Glowa et al., 2016). The military yet does not utilize the ACE questionnaire to identify HR SMs despite the advances of ACE literature, the AAP policy, and guidance from CDC, SAMHSA, WHO, and other high-profile organizations.

Conceptual Model

The conceptual model for this dissertation (see Figure 2) illustrates how ACEs during a SM's formative years may contribute to becoming non-deployable. Additionally, the conceptual model illustrates how using the ACE questionnaire can effectively aid in identifying HR SMs. The conceptual model depicts the concepts specific to this paper

starting with attachment styles and ending with a referential question, how to identify HR SMs?

Attachment theory posits that childhood experiences formulate an internal attachment model, whether the attachment is secure or insecure, during a SMs formative years and that the attachment styles transcend well into adulthood. The central tenets of attachment support the concepts of ACEs and vice versa. Those tenets are safe haven, separation distress, proximity maintenance, and secure base. Quality childhood experiences likely lead to secure attachment and healthy relationships, but deprived experiences likely lead to insecure attachments and unhealthy relationships. ACEs commonly affect the tenets of attachment negatively (Basham, 2008; Murphy et al., 2014; Sedighimornani et al., 2020).

Divorce is a more common ACE and is used throughout this chapter to illustrate the conceptual model's key ideas. For example, parents' divorce will likely, and negatively, influence a SM's attachment, even if the SM had a secure attachment previously before divorce. The divorce can influence the quality and break the bonds of safe haven and proximity maintenance, increase distress from prolonged separation, and dissolve a secure base. The early stages of an insecure attachment may have germinated if the SM was not consoled during the adverse experience of a divorce. Additionally, all typologies of abuse and neglect may also contribute to a SM's wellbeing. Many publications have reported a significant relationship among PTSD, depression, and anxiety and an individual with ACEs and insecure attachments (Basham, 2008; Grajewski & Dragan, 2020; Kinniburgh et al., 2017; Levine & Heller, 2012; Li et al., 2020; Murphy et al., 2014; Nakazawa, 2015; Sedighimornani et al., 2020; Sheinbaum et

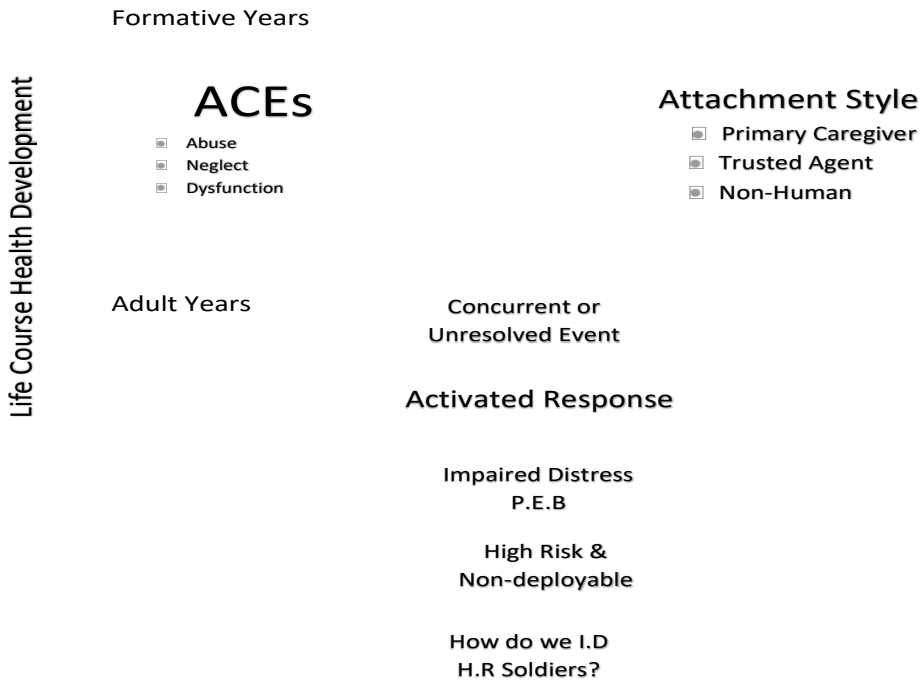
al., 2015; Siegel & Bryson, 2012; Tamman et al., 2019; Yerkovich & Yerkovich, 2017). It is important to reiterate that researchers suggest that 73.6% to 90.5% of mental health patients with mild to chronic conditions have an insecure attachment style (Bucci et al., 2015).

In short, the tenets of attachment regulate an attachment style contingent upon an individual's experiences. Moreover, an ACE such as a divorce disrupts the tenets of attachment by fracturing the bonds of trust resulting in fragmented current relationships and fostering an insecure attachment style. An insecure attachment will likely affect relationships, romantic or otherwise, later in life.

The SM may reexperience feelings of abandonment from their parents' divorce when they become adults. Based on attachment theory, a SM with ACEs facing an upcoming deployment or an extended training exercise may respond in a way characteristic of people with insecure attachments. For example, if the SM is currently in a romantic relationship, the SM will activate the implicit memories subconsciously from unresolved childhood events such as parental divorce, which percolates fears of abandonment. At first, the SM may display anxious, subtle efforts to maintain proximity to their secure base and safe haven to avoid being separated: i.e., deployed, away from their partner. However, the subtlety may quickly turn to desperate, frantic efforts such as going absent without leave (AWOL) to avoid perceived abandonment. The distress may impair the SM physically, emotionally, and behaviorally (PEB) to the point of receiving a mental disorder diagnosis from a health clinician, and the SM becomes HR and non-deployable per MOD policy.

Military commanders and military clinicians alike have received pressure to identify SMs before they become HR and non-deployable. They, much like their civilian counterparts, can use the ACE questionnaire to screen for and determine present ACEs and provide preemptive treatment. Health clinicians can complete the screening upon the SM reporting to their first duty station. The SMs identified with multiple ACE can then receive psychoeducational therapy to provide insight into their attachment styles, ACEs, and the associated effects. The military would be in accord with the guidelines and policies of leading health organizations if they used the ACE questionnaire to screen during assessments. A therapist can also teach coping skills to reverse the common effects of ACSs, such as depression, anxiety, and chronic pain. Thus, using the ACE questionnaire can mitigate the surging number of non-deployable SMs.

Figure 3. Conceptual Map



This conceptual model is notedly not meant to be deterministic: not every SM with ACEs and insecure attachments becomes impaired. Also, having zero or very few ACEs does not guarantee a secure attachment, nor does it automatically imply that a child with a high number of ACEs has an insecure attachment. Moreover, unproductive parenting behaviors that do not meet the maltreatment definition might still negatively affect attachment. The evidence provided illustrates how both ACEs and attachment styles corroborate and contribute to impaired distress among SMs. Additionally, not every SM with a DSM-V diagnosis becomes high-risk (HR) and non-deployable. It is contingent upon the level of impairment the SM expresses to become HR and non-deployable. However, the prevalence of ACEs in the military remains relatively unknown.

Despite promising research, a comprehensive determination has yet to establish the prevalence of ACEs in the military. Selected studies have focused on ACEs in the military, but they lacked a representative sample among military populations (Arincorayan et al., 2017). Some of the studies only sample males, while other studies sample only patients at a behavioral health clinic (Applewhite et al., 2016; Cabrera et al., 2007). Other studies included veterans retired from service for many years (Laird & Alexander, 2019) or foreign military (Sareen et al., 2013; Zheng et al., 2016).

The research gap suggests a need to better understand the prevalence of ACEs of SMs currently in the military, which includes senior enlisted SMs, officers, and female participants. This study addressed that gap and sampled all military branches. Additionally, this study tests the rate of ACEs and level of distress. A SM's distress score may indicate an underlining mental health diagnosis questioning their deployment status

as shown in Figure 4. As such, the central purpose of this study is to 1) describe the rate of ACEs in the military from a non-clinical sample. The sample will include more higher-ranking SMs and more female participants. 2) determine which distress scores for PTSD, anxiety, and depression significantly differ by an increase in ACE score, and 3) determine the role of ACEs in predicting distress by either PTSD, depression, or anxiety. The process for achieving these aims consists of rigorous methods.

Figure 4. Analytical Map

Chapter Three: Methodology

The US military is actively attempting to identify SMs considered higher risk (HR) and more susceptible of having mental health impairments. As previously discussed, utilizing the ACE questionnaire in civilian health clinics to screen and treat ACE's negative health effects in high-risk patients has shown promising outcomes to reverse those negative effects. The aim of this study is to 1) describe the rate of ACEs in the military individually and across each branch from a unique, non-clinical sample; 2) determine which distress scores for PTSD, anxiety, and depression significantly differ by a SM's ACE score; 3) determine if ACEs can predict distress. Policy and changes to health practices could reduce the non-deployable rate by knowing the prevalence of ACEs in the military population. The sample is unique to other military ACE studies because it is non-clinical, the sample is from SMs from several locations and not influenced by the same environmental operational tempo, the study sampled multiple branches of the US military, and the sample has more female and officer participants. Additionally, having a non-clinical sample assists to generalize findings. Having a clinical sample to investigate ACEs in a population is akin to trying to find sick people in a hospital. This chapter provides an in-depth overview of the methods utilized to achieve the aims of this study by describing the participants, variables, materials, procedures, and plan for data analyses.

This study was guided structurally by the Checklist for Reporting Results of Internet E-Surveys (CHERRIES). With the proliferation and utilization of internet-based surveys, the *Journal of Medical Internet Research* (JMIR) suggests CHERRIES as a best practice protocol when conducting web-based surveys and research. The CHERRIES

checklist requires certain items to be satisfied. Those items are answered in their respective sub-headings.

CHERRIES suggest avoiding the term response rate since, "there is no single response rate…[and] no standard methodology [to calculate] a 'response rate'" (Eysenbach, 2012, p.2). Instead, the author suggests describing the view rate, participation rate, and completion rate. The other items to be satisfied as suggested by the author are:

- discuss if any incentives were offered
- discuss what timeframe the data were collected
- discuss if the questions were randomized
- discuss if adaptive questioning or conditional questioning were utilized
- report the number of question items per page and how many screen pages
- discuss if there was a completeness check before submission
- state if respondents were able to review or change their answers
- discuss if there were any unique visitors
- discuss if cookies were used to assign a user ID to each client computer
- indicate whether or not the IP address of a respondent was used to identify potential duplicates
- indicate if other techniques were used to identify duplicate entries
- discuss if respondents had to register for the survey
- discuss if only completed questionnaires are included for analysis
- indicate if there will be a time limit for respondents to complete the survey
- indicate if any statistical correction methods such as weighting of items or propensity scores have been used for non-representative samples.

Hereafter, when the phrase "per CHERRIES" is written, it refers to the aforementioned guidelines. Due to CHERRIES' rigor for web-based surveys, this proposal's methodology adheres to the CHERRIES checklist (Eysenbach, 2012).

Participants and Description of Sample

The researchers adhered to the policies for the protection of human subjects, as written in 45 CFR § 46. The Institutional Review Board (IRB) at the University of Kentucky approved this study protocol and previously approved all procedures in relation

to a previous academic requirement. Additionally, the method for data analyses was included in the IRB proposal.

This study recruited SMs of the U.S. Armed forces. The population of the sample consisted of participants on active duty, National Guard, and reserve units. Pertaining to all branches of active duty in 2019, the population consisted of over 1.3 million SMs, containing 82.4% enlisted SMs and 17.6% officers. The Army was the largest branch of the military with a total force strength of 479, 785 (36.2%) SMs, followed by the Navy with 332,528 (25.1%) SMs, Air Force with 327,878 (24.7%), and Marine Corps with 186,009 (14%) SMs. Of those total active-duty SM percentages, 83.1% identify as male and 16.9% identify as female. The racial distributions consist of 68.8% Caucasian and 31.2% minority (Department of Defense, 2019). The population of all National Guard and reserves is comprised of 807,602 SMs with 83.5% enlisted, 16.5 officers with 79.4% being male and 20.6% being female (Department of Defense, 2019). It is also important to note that recruitment of US SMs is not disproportionate to any middle-class quintile. In fact, the highest and lowest middle-class quintiles are underrepresented (Council on Foreign Relations, 2019).

Recruitment for participants was achieved via two voluntary, non-probability sampling techniques to measure the prevalence of ACEs and current distress: a snowball sample and a convenience sample on social media sites. The study solicited multiple demographics: age, self-identified gender, race and ethnicity, rank, marital status, levels of education, deployment experience, time in service, and military occupational skill. A random $25.00 gift card drawing was available for participants who complete the survey to enter to win.

Plan to Protect Human Subjects

This study's focus is to predict the distress of SMs in the military and describe their rate of ACEs. This study required SMs to sign a consent form indicating that they participated voluntarily and without coercion. The solicited questions are personal and sensitive and could have evoked an emotional response. Participants were provided a free resource (800) number in the consent form and at the top of each page to mitigate risk. Researchers did not solicit personal identifying information. If the participant elected to enter the random drawing for one of four $25.00 gift certificates, they were directed to a separate link isolating their response. If the participant proceeded to the drawing, the participant was asked to provide their phone number or email following their completion of the survey as an official entry to the random drawing.

Variables

The ACE scale was the variable for the first aim to analyze and describe the prevalence of ACEs in the military from a sample with more female and officer participants. The PC-PTSD 5 (PTSD), PHQ-9 (depression), and GAD-7 (anxiety) scales were the dependent variables to determine current distress, and the three ACE group scores were the independent variable for the MANOVA analysis. The predictor variables for the third aim and second research question included SES, gender, and age. The control variables include rank, TIS, and ethnicity. The outcome variable was the PTSD score. The survey had additional variables not analyzed in this study. Additionally, the sample represented a diversity of occupations, rank, completed education level, and racial and ethnic backgrounds, respectively as shown in Table 1.

Description of Materials and Measurement Instruments

Informed consent (Appendix G) was obtained upon the participant's acknowledgment to continue the survey. This study utilized Qualtrics to develop the survey. ACEs are defined by the 10 scenarios identified in Felitti's seminal study (Felitti et al., 1998). Distress is conceptualized and defined by having a clinically significant score indicating the possibility of one or more of the following diagnosis: PTSD, depression, or anxiety. Self-report measures will measure the distress scales: Primary Care PTSD Screen for DSM-5 (PC-PTSD-5), Patient Health Questionnaire (PHQ-9) for depression, and General Anxiety Disorder (GAD-7) for anxiety. All of the listed measurements are self-reported questionnaires and have been through rigorous testing for validity and reliability in the military (Cabrera et al., 2007; Conway et al., 2020; Fritch et al., 2010; Gahm et al., 2007).

ACE Questionnaire

The ACE questionnaire (Appendix B) is a 10-question, dichotomous, yes/no survey to elicit and total the number of adverse events before age 18. These events include maltreatment, physical/sexual or emotional abuse, parent divorce, having a household member with mental illness, substance abuse or incarceration, and domestic violence. Although the ACE is a retrospective questionnaire, answers from participants have demonstrated dependable test-retest reliability, indicating that repeated responses are consistent (Dube, Williamson, Thompson, Felitti, & Anda, 2004; Pinto, Correia, & Maia, 2014) with an adequate internal consistency with a Cronbach's $\alpha = 0.88$ (Murphy et al., 2014). Additionally, the ACE questionnaire has been validated sampling military populations as discussed in the literature review and Appendix A. The ACE total sum for all ten items provides a range of 0-10 for severity scores. A guideline of cutoff scores is

not provided. The lack of a cut-off score is due to a dosage response, meaning the more ACEs one reports, the higher the probability one may have to negative health outcomes. Some studies, such as Felitti (1998), suggest a score of four ACEs as a critical score to assess for further evaluation. Therefore, ACE scores will be categorized into three group: zero ACEs, one to three ACEs, and four or more ACEs.

There are currently several modifications to the ACE questionnaire. These modified ACE questionnaires are derived from the seminal ACE study that has been most rigorously validated. This study utilizes the original ACE questionnaire with one modification. The original ACE questionnaire states the influence of parents multiple times. The word "parent" was used because the original study was conducted in 1998 and targeted a middle-class population. With the scale designer's permission, the scale was changed to be more inclusive and modernized. The word "parent" is restrictive regarding inclusiveness and cultural sensitivity. The term primary caregiver (PC) substitutes "parent" and best describes the needed criteria to be more inclusive and culturally sensitive. The conceptualization of PC is as follows: "an individual such as but not limited to your biological parent(s), step-parent(s), grandparent(s), another family member, foster or adopted parent(s), aunt/uncle or other legal guardians who were responsible for your daily care and rearing." This study rephrases those questions with the word "parent" to "primary caregiver" (V. Felitti, personal communication, October 21, 2019). The intent is to increase the sensitivity of the measure and to better identify those with ACEs.

PC-PTSD-5

The PC-PTSD-5 (Appendix C) is a screener used to detect a probable PTSD diagnosis and comprises a dichotomous, yes-no response scale. The PC-PTSD-5 is a five-

item screener designed for primary care settings to assess for probable PTSD with respondents quickly. The first question addresses the exposure of the respondent to traumatic events, the first criteria for PTSD. If the respondent denies exposure, the questionnaire is complete. However, four other questions are given paralleling the other criteria for a PTSD diagnosis if the respondent reports exposure. The PC-PTSD-5 scores from 0-5 and the sensitivity cutoff score to correctly identify an individual with a possible diagnosis is three. The diagnostic accuracy for PTSD is excellent sensitivity at 0.94. Additionally, the PC-PTSD demonstrates a specificity of ≥ 0.80 (Prins et al., 2016).

PHQ-9

The PHQ-9 (Appendix D) is a screener to detect probable depression and other mental health diagnoses and comprises a nine-item Likert response scale. The PHQ-9 score is generated by summing the total of each question. The scoring is as follows: each question scores from 0-3 corresponding to Likert categories "not at all," "several days," "more than half the days," and "nearly every day," respectively. The PHQ-9 total sum for all nine items provides a range of 0-27 for severity scores. Additionally, a guideline of cutoff scores is provided: respectively, scores of 5, 10, 15, and 20 correspond to represent mild, moderate, moderately severe, and severe depression. A score ≥ 10 has a sensitivity of 88% and a specificity of 88% for major depression. The PHQ-9 has excellent internal reliability with a Cronbach's α of 0.86 and 0.89 in an Ob-Gyn clinic and primary care clinic (Kroenke et al., 2001).

GAD-7

The GAD-7 (Appendix E) is a screener for probable General Anxiety Disorder, and it also consists of summed Likert response items. It encompasses a seven-item screener with each question scoring 0-3 corresponding to Likert categories "not at all,"

"several days," "more than half the days," and "nearly every day," respectively. The GAD-7 total sum for all seven items ranges from 0-21. Additionally, a guideline of cutoff scores is provided: respectively, scores of 5, 10, and 15 correspond to represent mild, moderate, and severe anxiety. A cutoff score of ≥ 10 provided a sensitivity of 89% and a specificity of 82%. The internal consistency of the GAD-7 is excellent, with a Cronbach's α= 0.92. The GAD-7 also has reliable validity and reliably to screen for panic disorder, social anxiety disorder, and PTSD (Spitzer et al., 2006).

Study Design and Procedures

This study utilizes a cross-sectional study design and an internet-based survey to describe ACEs in this military sample and determine if ACEs can predict current distress. The survey was developed by Qualtrics software version 20, and available at https://www.qualtrics.com (Qualtrics, 2020). A total of 38 questions were included in the survey.

Per CHERRIES, the questions in the survey were not in random sequence but followed a purposeful flow. The technical functionality and usability of the electronic survey had been tested multiple times before fielding. The survey was advertised on 17 privately owned social media sites affiliated with each branch of the military, excluding Space Force. Control measures were employed to screen for inclusion criteria. A majority of the social media sites were closed groups strictly only for military members and veterans. The survey's first question asked if the participant affirms they are currently in the service. Additionally, the cover letter also provided details about who is appropriate to participate. The survey was open for data collecting from March 2020 to July 2020 and posted on each social media page approximately every 10 days, alternating between weekends and weekdays.

Per CHERRIES, a completeness check was enabled via Qualtrics before participants submitted the survey. Additionally, the participants were allowed to go back and view or change previous answers. Participants were given 90 days or until the survey's expiration to complete their survey once they had started. Qualtrics software inhibited the same IP address from completing the survey to prevent duplicate entries. That said, IP addresses were not recorded to ensure privacy and confidentiality.

The primary sampling protocol consisted of utilizing private social media sites affiliated with each branch of the military and posted an ad to recruit participants. A second technique for recruitment utilized the snowball technique. The protocol consisted of the primary researcher inviting personal peers, co-workers, and acquaintances currently in the service to participate in the study. The participants were encouraged to ask their personal peers, co-workers, and acquaintances in the service to participate.

A drawing of four $25.00 Amazon gift cards were incentivized to increase participation and decrease the dropout rate. One gift card was given away for each branch of the military with the four highest survey completion rates. Because the Coast Guard is the smallest of the military branches, Coast Guard members who completed the survey were added to the lowest two represented military branches. An additional $50.00 Visa gift card was given away to a participant representing the military branch with the highest completion rate, which was the Army. In order to enter the drawing, participants were provided a separate link to copy and paste into a separate web-tab to maintain anonymity at the end of the survey. The survey for participants remained open for three to four months to allow maximum participation. Participants are also allowed to back-step to

previously answered survey questions to change a selection if they desire while completing the survey.

Participants were given an option to acknowledge their participation and provide consent at the beginning of the survey. If participants did not acknowledge consent, they were directed to the end of the survey. Per CHERRRIES, only those that met criteria for the study counted as a view rate.

Plan for Data Analysis

The software for the analysis was IBM SPSS Statistics (Version 26) of the completed surveys. This study has three aims and two research questions:

1. Investigate ACEs from a more unique US military sample across all branches of the military and individually.
2. Which distress scores for PTSD, anxiety, and depression significantly differ by an increase in a SM's ACE score?
3. Can a SM's ACE score can predict distress?

Univariate descriptive statistics provided statistical analysis for the first aim. The primary investigator (PI) analyzed ACE scores from each branch of the military separately and collectively. Though it was not anticipated to find any difference of ACE rate among the branches of the military, the analysis investigating the rate of ACEs in each branch is useful. Additionally, it was hypothesized that there will be no difference in the rate of ACEs in the military as compared to the rate of ACEs found in the extant literature review about ACE studies in the military and withing the range of ACEs found in Felitti's (1998) original ACE study.

To examine research question two, the PI conducted a multivariate analysis of variance (MANOVA) to assess if mean differences exist on distress scores of PTSD, anxiety, depression, and between the levels of a SM's ACE score. MANOVA has several benefits. By testing several DVs simultaneously, a researcher can identify which factor

has a greater effect when the DVs are correlated. Additionally, patterns between the multiple DVs can be detected. The MANOVA is an appropriate statistical analysis when the purpose of research is to assess if mean differences exist on more than one continuous dependent variable (DV) by one or more discrete independent variables (IV). MANOVA tests the difference in two or more vectors of means. Additionally, MANOVA allows a researcher to composite and analyze the strength of association between multiple DVs and the IV simultaneously (Overall & Klett, 1972).

Specifically, for this study, the second aim was to investigate the relationship of a SM's ACE score and distress as conceptualized by having a clinically significant score of either PTSD, anxiety, and/or depression. As mentioned above, distress is conceptualized as a SM's score for PTSD, anxiety, and depression. A MANOVA will test the SM's ACE (IV) to a SMs distress scores (DV). The hypotheses are:

I. H_o: Distress (as measured by PTSD, anxiety, and depression scores) are not significantly different when grouped by ACE score.
II. H_a: PTSD, anxiety and depression scores are significantly different when grouped by ACE score.

The PI assessed for the assumptions of multivariate normality, homogeneity of covariance matrices, multivariate outliers, and absence of multicollinearity. Multivariate normality assumes that every linear combination of the residuals of the MANOVA follows a univariate normal distribution. The PI assessed multivariate normality by graphically plotting the Mahalanobis distances of the residuals against the quantiles of a χ^2-distribution (Field, 2017; DeCarlo, 1997). Homogeneity of covariance matrices assumes that covariance matrices for each within-group is equal. A Box's *M* test will examine the assumption. Multivariate outliers were determined by calculating the

Mahalanobis distances on the residuals and comparing the distances to the .999 quantile of a χ^2-distribution with the degrees of freedom being n-3, where n is the number of variables conducted on the dependent variable. Absence of multicollinearity requires that the dependent variables are not too highly correlated ($|r| > .9$) with each other. Pearson correlations will be conducted for each pair of the dependent variables to examine multicollinearity.

MANOVA assesses whether mean differences among groups with a combination of dependent variables are likely to have occurred by chance. The MANOVA creates a linear combination of the dependent variables to create a grand mean and assesses whether there are group differences on the set of dependent variables. The Pillai-Barlett trace test was utilized as it is preferred over Wilk's Lambda test and hoteling test (Olson, 1979). This test statistic is a positive value ranging from 0 to 1, and the higher the value means the effects are contributing more to the model. An increasing value provides evidence to reject the null hypothesis. The Pillai-Barlett trace test is less vulnerable to violations of the MANOVA assumptions and better reduces Type I error. The MANOVA will apply the F-test to determine if there are any significant differences at a significance level, $\alpha = .05$. The results from the MANOVA indicating which of the distress scores with the highest effect and covariance determined which distress scale was used for the third aim and second research question of this study.

Data analysis for the third aim utilized Hierarchal linear regression (HLR). Regression analysis is commonly used for modeling and predicting relationships between a dependent [distress] variable and one or more predictor variable [ACEs]. Thus, for the purpose of this study, the PI is investigating if ACE score can predict distress as

measured by a SM's PTSD score. HLR analysis is a way to show if independent variable(s) (IV) of interest explain a statistically significant change in variance on the dependent variable (DV) after controlling for all other relevant variables (Lewis, 2007). Compared to other methods, HLR allows greater autonomy for a researcher to conduct analysis by relying on the researcher's knowledge of the subject and theory to determine the sequence of predictor variables to be tested and variables to be controlled (Lewis, 2007). HLR also assists with issues of degrees of freedom, identification of which predictor set of a prespecified size, and replicability that other methods possess (Lewis, 2007).

In total, the PI tested five models to determine whether or not ACEs predict PTSD and to determine if those with a higher ACE score will differ from those with lower ACE scores. Model one tested the relationship between a SM's PTSD score and ACE score, ($\widehat{PTSD} = \widehat{\beta_0} + \widehat{\beta_1} ACE_i$). Model two tested the relationship between the SM's PTSD score, ACE score, and gender, ($\widehat{PTSD} = \widehat{\beta_0} + \widehat{\beta_1} ACE_i + \widehat{\beta_2} Female_i$). Model three tested the relationship between the SM's PTSD score, ACE score, gender, and ethnicity, ($\widehat{PTSD} = \widehat{\beta_0} + \widehat{\beta_1} ACE_i + \widehat{\beta_2} Female_i + \widehat{\beta_3} Minority_i$). Model four tested the SM's PTSD score, ACE score, gender, ethnicity, and TIS, ($\widehat{PTSD} = \widehat{\beta_0} + \widehat{\beta_1} ACE_i + \widehat{\beta_2} Female_i + \widehat{\beta_3} Minority_i + \widehat{\beta_4} TIS_i$), and model five tested the SM's PTSD Score, ACE score, gender, ethnicity, TIS, and SES, ($\widehat{PTSD} = \widehat{\beta_0} + \widehat{\beta_1} ACE_i + \widehat{\beta_2} Female_i + \widehat{\beta_3} Minority_i + \widehat{\beta_4} TIS_i + \widehat{\beta_5} SES_i$).

It was anticipated that age and time in service (TIS) will have multicollinearity. Therefore, age was notadded to the model. A SM could be 40 years of age and be the rank of specialist with five years TIS or a lieutenant colonel with 15 years TIS. Contextually, conceptually, and methodologically, TIS is a better covariate in this study.

Each model was compared to determine which is the better performing model, which model best reduces the residual error, and which model has the highest statistical significance of r^2 at the 5% statistical level. The PI hypothesized that there is no linear relationship between the variables in each of the models (H_O: $\beta = 0,$), and the alternative hypothesis (H_A: $\beta \neq 0$) is that there is a linear relationship between the variables in each of the models.

The PI assessed for assumptions of linear regression — specifically linearity, homoskedasticity, normality, and multicollinearity — prior to testing. The assumption of the data being measured is already satisfied for validity and reliability. The measurements for distress, PC-PTSD5 (PTSD), GAD-7 (anxiety), and PHQ-9 (depression) are currently in use in health clinics to assist in the diagnosis of their respective disorders. They have been through rigorous testing for validity and reliability (see materials section above).

Chapter Four: Results

The purpose of this study is to describe the rate of ACEs in a unique, non-clinical sample, to determine if scores for PTSD, anxiety, and depression significantly vary in relation to ACE score, and to determine if ACEs can predict a SM's distress. A sample of SMs from the U.S. Armed forces were recruited to respond to measures of psychological distress and to report any history of adverse childhood experiences. The following three aims and two research questions with hypotheses guided the analyses for this study:

1.What is the rate of ACEs in a unique non-clinical, US military sample?
2. Which distress scores for PTSD, anxiety, and depression significantly differ by ACE score?
   H_o: PTSD, anxiety, and depression scores do not significantly differ by ACE score.
   H_a: PTSD, anxiety, and depression scores significantly differ by ACE score.
3. Can a SM's ACE score predict distress (PTSD, anxiety, or depression)?
   H_o: $\beta = 0$, there is no linear relationship between the covariates in each model.
   H_a: $\beta \neq 0$, there is a linear relationship between the covariates in each model.

This chapter provides a description of the samples included in the study. This chapter also provides a detailed description of the assumptions tests, such as homogeneity and multicollinearity for each test, as well as the results of the hypotheses testing to address the research questions. This chapter ends with a summary of the key findings from the quantitative analyses conducted in the study.

Missing Data

Prior to analysis, the researcher reviewed data for completeness. A total of 620 participants completed the demographics and ACE questionnaire only, while 600 participants completed the entire questionnaire to answer the first and second research questions in the study. Because there were only a few *(n=20)* surveys missing excessive values for all psychometric scales in the data set, the 20 surveys were removed using

listwise deletion for analysis for the first and second research questions. Of the remaining 600 surveys, 15 were missing values for age. Multiple imputation regression method was used to deal with the missing age values. Multiple imputation is an unbiased method to approach missing data. Multiple imputation utilizes a regression-based procedure using random simulations of other participants' values to replace missing data with plausible values. The simulation occurs multiple times to create different estimates of the missing value to complete a data set (Enders, 2010; Jakobsen et al., 2017). The researcher identified the missing values for age as missing at random (MAR), which is a requirement for multiple imputation.

Statistical Analysis

The demographic characteristics of participants are presented in Table 1. Out of the 600 participants, 372 participants were males (62%), 224 females (37%), and four selected prefer not to answer (<1%). A majority of the participants were married (n = 340, 56.6%) while 212 participants were never married (35.3%). In terms of the branch of service, there were three main branches, namely Army, Air Force, and Navy. There were 343 participants representing the Army, 232 participants representing the Air Force, and 26 participants for the Navy. Regarding ethnicity, the majority of the participants were Caucasians (n = 438, 72.9%). The other three highest represented ethnicities are African Americans (n=53, 8.8%), Hispanic whites (n=34, 5.7%), and Asians (n=31, 5.2%). Participants were also distributed across all pay grades including senior ranking SMs up to E-9 and O-6. Moreover, for the highest level of education, (n=198, 33%) participants were college graduates while participants reporting to have a graduate school degree were (n=174, 28.8%). Participants were also distributed across various military occupational

skills. For socioeconomic status (SES), the majority of the participants were from the lower-middle class (*n*=254, 42.3%), followed by upper-middle class (*n* = 165, 27.5%). Analysis for exploring ACEs only, the total participants (*n*=620) were included; however, if ACEs and any other measure were explored, the total participants of (n=600) were included for analysis. The Table 1 represents the demographics for participants for research questions two and three.

A Cronbach's alpha reliability coefficient was also tested for each distress measure and the ACE questionnaire. The results indicated an acceptable to excellent level of inter-item correlation. The PC-PTSD DSM 5 scale consisted of five items (*a*=.78), the scale for anxiety consisted of 7 items (*a*=.92), the depression scale consisted of 9 items (*a*=.91), and the adverse childhood experience scale consisted of 10 items (*a*=.78). The results of the reliability analysis determined that all constructs were measured with internal consistency. Thus, the survey instruments were reliable in measuring the constructs of this study.

Table 1

Demographic Characteristics of Participants (N = 600)

		Frequency	Percent
Gender	Male	372	61.9
	Female	224	37.3
	Prefer Not to Answer	4	0.5
	Total	600	100.0
Marital Status	Married	340	56.6
	Widowed	4	0.7
	Divorced	35	5.8
	Separated	10	1.7
	Never married	212	35.3
	Total	600	100.0
Branch of Service	Army	156	26.0
	Army Reserve	36	6.0

Table 1 (Continued)	Army National Guard	151	25.1
	Air Force	183	30.4
	Air National Guard	23	3.8
	Air Force Reserve	25	4.2
	Navy	4	0.7
	Navy Reserve	2	0.3
	Marines	7	1.2
	Marine Reserves	12	2.0
	Coast Guard	1	0.2
	Space Force	1	0.2
	Total	600	100.0
Ethnicity	African American	53	8.8
	Asian	31	5.2
	Pacific Islander	5	0.8
	Caucasian white	438	72.9
	Hispanic Non-White	22	3.7
	Native American	4	0.7
	Unknown	3	0.5
	Other please specify	11	1.9
	Hispanic White	34	5.7
	Total	600	100.0
Pay Grade/Rank	O1	40	6.7
	O2	32	5.3
	O3	96	16.0
	O4	56	9.3
	05	28	4.7
	06	5	0.8
	E1	37	6.2
	E2	30	5.0
	E3	36	6.0
	E4	58	9.7
	E5	50	8.3
	E6	71	11.8
	E7	26	4.4
	E8	8	1.3
	E9	2	0.3
	W1	9	1.5
	W2	9	1.5
	W3	3	0.5
	W4	2	0.3
	W5	1	0.2

Table 1 (Continued)

	ROTC/Academy/WestPointTraining	2	0.3
	Total	600	100.0
Highest Level of Education	GED	5	0.8
	High School	99	16.5
	Some College	125	20.8
	College Graduate	198	32.9
	Graduate School: Master's degree or higher	174	28.8
	Total	600	100.0
Military Occupational Skill (MOS)	Combat Arms ie. Infantry, Artillery, SPEC OPs, Aviators	136	22.6
	Combat support ie. Military Police, Signal, Intelligence	143	23.8
	Service Support ie. Logistics, transportation, Finance, Personnel	177	29.5
	Specialty branch ie: JAG, Chaplain, Medical, Medical support, Dental, Veterinarian, Nurse	144	24.0
	Total	600	100.0
Deployed	Yes	343	57.1
	No	258	42.9
Total		600	100.0
SES	low income, poverty	86	14.3
	Upper-lower	87	14.5
	Lower Middle	254	42.3
	Upper Middle	165	27.5
	Upper	7	1.2
	Total	600	100.0
Total		600	100.0

Participants were also asked to provide their age and time in service. There were 16 missing responses for age and one missing response for time in service (TIS). These demographic characteristics were continuous in nature. Multiple imputation regression was the method used to complete the missing age and TIS values. Summary statistics such as the mean, standard deviation, and range values were used to describe the data.

Based on the results presented in Table 2, the age range of participants was from 18 to 60 years old with a mean of 30.72 years old and a standard deviation of 8.59 years. For the time in service variable, the range was less than one year to 39 years with a mean of 8.84 years (*SD* = 6.93).

Table 2

Descriptive Statistics of Age and TIS

	N	Min	Max	Mean	SD
Age	600	18.00	60.00	30.72	8.59
TIS	600	1.00	39.00	8.84	6.93

Summary statistics of the study variables are presented in Table 3. The variable scores were calculated based on the guidelines of the respective survey questionnaires. The total ACE score ranged from 0 to 10 with a mean of 1.97 (*SD* = 2.25). The total ACE score represents the number of adverse events before the age of 18. The mean score indicated that there were few adverse events for participants before the age of 18. The PTSD scores were low, ranging from 0 to 5 with a mean of .91 (*SD* = 1.55). The GAD is the measure of anxiety. The scores of participants ranged from 0 to 21 with a mean of 5.30 (*SD* = 5.25). The result showed that an average participant has mild to moderate anxiety symptoms. The PHQ score measured probable depression and other mental health diagnoses. The PHQ ranged from 0 to 25 with a mean of 5.34 (*SD* = 5.73), indicating that an average participant also has mild to moderate depression disorder as well.

Table 3

Descriptive Statistics of Study Variables Scores

	N	Min	Max	Mean	SD	Theoretical Range
ACE	600	0.00	10.00	1.97	2.25	0-10
PTSD	600	0.00	5.00	0.91	1.55	0-5
GAD	600	0.00	21.00	5.30	5.25	0-21
PHQ	600	0.00	25.00	5.34	5.73	0-25

For the purpose of the MANOVA which considered the ACE score as the independent variable, the ACE scores were categorized into three groups. Researchers in extant literature used similar groups for ACE scores (Wade et al., 2017). Participants with a score of four or more ACEs are determined as the higher cutoff score because that population has been established at highest risk for chronic disease and maladaptive behaviors to cope with emotional turmoil (Burke Harris et al., 2017; Felitti et al., 1998; Halfon et al., 2018; Wade et al., 2017). Therefore, participants with no ACE were categorized as 0 ACE. Participants with total ACE score from 1 to 3 were categorized as 1-3 ACEs, and participants with total ACE score from 4 and above were categorized as 4 or more ACEs. There were 218 participants categorized as 0 ACE (36.3%), 252 participants categorized as 1-3 ACEs (41.9%), and 131 participants categorized as 4 or more ACEs (21.9%).

Table 4

Frequencies and Percentages of Participants in ACE Categories

		Frequency	Percent
ACE Category	0 ACE	218	36.3
	1-3 ACEs	252	41.9
	4 or more ACEs	131	21.8
	Total	620	100.0

For the first aim of the study, the rate of ACEs with participants had a range of 0-10 with the average of nearly two total ACEs (M=1.97, SD 2.25). The differences in ACE scores among service branches were analyzed using an ANOVA test. The independent variable is the categorical variable, branch category being Army, Air, or Navy. The descriptive statistics of ACE scores per branch category is presented in Table 5. The data showed that the highest mean ACE score is observed for the Air Force (M = 2.09, SD = 2.22), followed by the Navy (M = 2.00, SD = 2.51). The lowest mean ACE score is observed for the Army (M = 1.88, SD = 2.25).

Table 5

Descriptive Statistics of Total ACE Scores by Branch Category

	N	Mean	SD	Min	Max
Army	343	1.88	2.25	0.00	10.00
AF	232	2.10	2.22	0.00	9.00
Navy	26	2.0	2.51	0.00	8.00
Total	620	1.97	2.25	0.00	10.00

The result of the ANOVA is presented in Table 6. The result of the ANOVA showed that there is no significant difference in total ACE scores of participants among the three branch categories $F(2, 600) = .60$, $p = .55$). Therefore, there is insufficient

evidence to conclude that there is a difference in total ACE scores among Army, Air Force, and Navy participants.

Table 6

ANOVA of ACE between Branch Categories

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	6.13	2	3.07	0.60	0.54
Within Groups	3031.20	598	5.06		
Total	3037.33	600			

To examine the second aim of the study and first research question, a MANOVA was used to determine whether there is a significant difference in PTSD, GAD, and PHQ scores based on ACE categories. The null hypothesis which stated that PTSD, anxiety, and depression scores do not significantly differ by ACE score was tested. The total ACE scores were categorized into three groups. The groups were 0 for ACE, 1 for 1-3 ACEs, and 2 for 4 or more ACEs. The dependent variables were PTSD, GAD, and PHQ scores, which were continuous in nature. Assumptions of MANOVA were tested prior to conducting the MANOVA. Table 8 presents the Shapiro-Wilk's test of normality for the dependent variables. The results showed that all three dependent variables were non-normally distributed (p= < .01). Thus, the assumption of normality was violated. There were also observed outliers in the data as presented in Figure 5. There was also a violation in homogeneity for PTSD F (2, 598) = 53.86, p-value < .01), GAD F(2, 598) = 12.36, p= < .01), and PHQ F (2, 598) = 13.92, p= < .01). The study involved a sizable sample of 600 participants. A large sample helps to determine a true mean and provides the assumption that the data is normally distributed; however, because of the

contradicting result of the normality test, the results of the analysis should be treated with caution.

Table 7

Descriptive Statistics of ACE Categories and Distress Measures

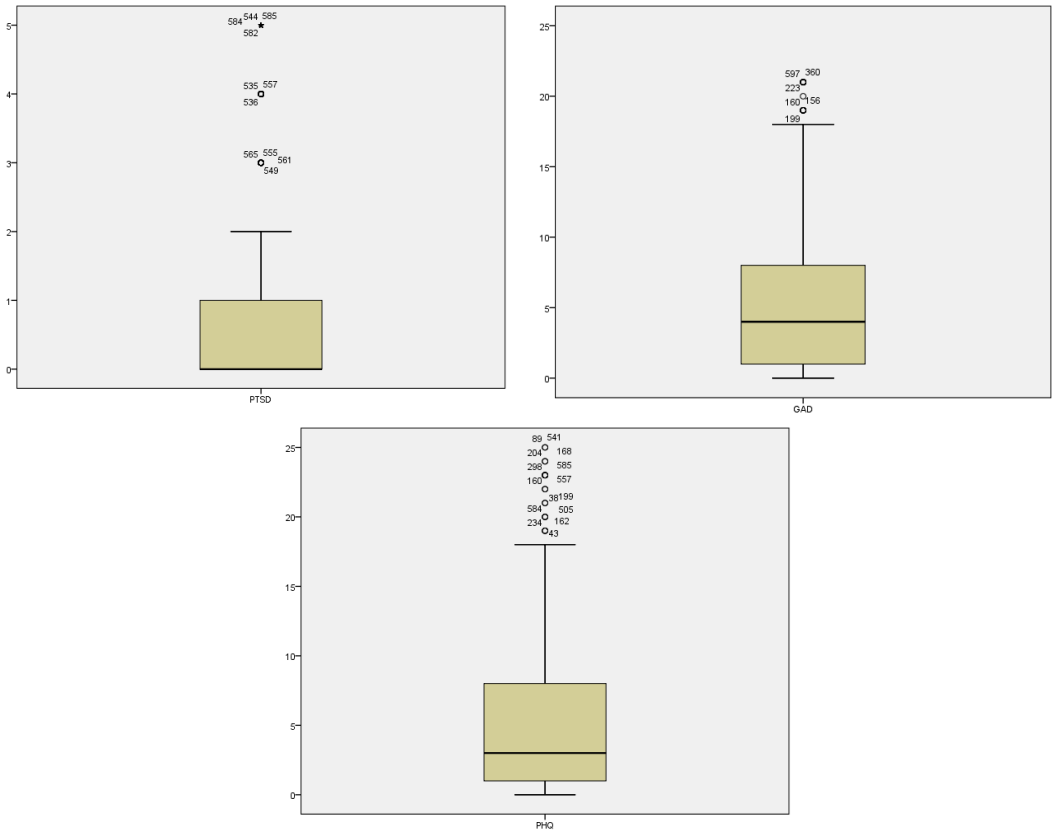
ACE Category		Mean	Std. Deviation	N
PTSD	*0 ACE*	.45	1.13	217
1-3 ACEs		.75	1.36	252
4 or more ACEs		1.95	1.96	131
Total		.91	1.55	600
GAD	*0 ACEs*	3.91	4.60	217
1-3 ACEs		4.77	4.61	252
4 or More ACEs		8.68	5.95	131
Total		5.31	5.25	600
PHQ-9	*0 ACE*	3.31	4.83	217
1-3 ACEs		4.49	5.02	252
4 or more ACEs		8.90	6.54	131
Total		5.18	5.71	600

Table 8

Normality and Homogeneity Test of PTSD, Depression, and Anxiety Scores

	Shapiro-Wilk			Levene's Test for Equality of Variances			
	Statistic	df	Sig.	F	df1	df2	Sig.
PTSD	0.636	600	0.00	53.85	2	598	0.00
GAD	0.871	600	0.00	12.36	2	598	0.00
PHQ	0.850	600	0.00	13.92	2	598	0.00

Figure 5: *Boxplots of PTSD, GAD and PHQ Scores*



The results of the MANOVA are presented in Table 8. The results showed that ACE categories have statistically significant scores for PTSD $F(2, 600) = 46.36$, $p =< .01$, GAD scores $F(2, 600) = 41.21$, $p = < .01$, and PHQ scores $F(2, 600) = 50.09$, $p = < .01$. The result of the Tukey post-hoc test is presented in Table 9. For PTSD, participants who have 4 or more ACEs ($M = 1.95$) have significantly higher PTSD scores than participants who have 0 ($M = .46$) and 1 to 3 ACEs ($M = .75$). For GAD, participants who have 4 or more ACEs ($M = 8.67$) also have significantly higher GAD scores than participants who have 0 ($M = 3.88$) and 1 to 3 ACEs ($M = 4.76$). Similarly, participants who have 4 or more ACEs ($M = 9.24$) also have significantly higher PHQ scores than participants who

have 0 (M = 3.43) and 1 to 3 ACEs (M = 4.96). The Pillai's Trace statistics for ACE categories was determined to be significant, indicating that there is a difference in dependent variables between the ACE categories F (2, 600) = 20.33, p= < .05). The effect sizes for ACE were also determined to be low at less than .20, indicating that the variance explained in PTSD scores of ACE groups only ranged from 12.1% to 14.4%. Therefore, the result of the analyses determined that higher ACEs are associated with higher scores on measures of post-traumatic stress disorder, depression, and anxiety.

Table 9

MANOVA Test of PTSD, GAD, and PHQ Scores based on ACE Categories

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	PTSD	192.78[a]	2	96.39	46.36	0.00	0.13
	GAD	2001.41[b]	2	1000.70	41.21	0.00	0.12
	PHQ	2822.92[c]	2	1411.46	50.09	0.00	0.14
Intercept	PTSD	619.74	1	619.74	298.11	0.00	0.33
	GAD	18562.49	1	18562.49	764.53	0.00	0.56
	PHQ	19230.51	1	19230.51	682.54	0.00	0.53
ACE_Recode	PTSD	192.78	2	96.39	46.36	0.00	0.13
	GAD	2001.41	2	1000.70	41.21	0.00	0.12
	PHQ	2822.92	2	1411.46	50.09	0.00	0.14
Error	PTSD	1243.18	598	2.07			
	GAD	14519.07	598	24.27			
	PHQ	16848.46	598	28.17			
Total	PTSD	1932.00	601				
	GAD	33410.00	601				
	PHQ	36827.00	601				
Corrected Total	PTSD	1435.96	600				
	GAD	16520.48	600				
	PHQ	19671.39	600				

a. R Squared = .13 (Adjusted R Squared = .13)

b. R Squared = .12 (Adjusted R Squared = .12)

c. R Squared = .14 (Adjusted R Squared = .14)

Table 10

Tukey Post Hoc Test of PTSD, GAD, and PHQ Scores based on ACE Categories

Dependent Variable			Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
PTSD	0 ACE	1-3 ACEs	-0.28	0.13	0.08	-0.60	0.02
		4 or more ACEs	-1.49*	0.15	0.00	-1.86	-1.11
	1-3 ACEs	0 ACE	0.28	0.13	0.08	-0.02	0.60
		4 or more ACEs	-1.20*	0.15	0.00	-1.56	-0.83
	4 or more ACEs	0 ACE	1.49*	0.15	0.00	1.11	1.86
		1-3 ACEs	1.20*	0.15	0.00	0.83	1.56
GAD	0 ACE	1-3 ACEs	-0.87	0.45	0.13	-1.94	0.19
		4 or more ACEs	-4.78*	0.54	0.00	-6.06	-3.50
	1-3 ACEs	0 ACE	0.87	0.45	0.13	-0.19	1.94
		4 or more ACEs	-3.91*	0.53	0.00	-5.16	-2.66
	4 or more ACEs	0 ACE	4.78*	0.54	0.00	3.50	6.06
		1-3 ACEs	3.91*	0.53	0.00	2.66	5.16
PHQ	0 ACE	1-3 ACEs	-1.52*	0.49	0.00	-2.68	-0.37
		4 or more ACEs	-5.80*	0.58	0.00	-7.18	-4.42
	1-3 ACEs	0 ACE	1.52*	0.49	0.00	0.37	2.68
		4 or more ACEs	-4.28*	0.57	0.00	-5.62	-2.93
	4 or more ACEs	0 ACE	5.80*	0.58	0.00	4.42	7.18
		1-3 ACEs	4.28*	0.57	0.00	2.93	5.62

Because the assumptions of homogeneity utilizing MANOVA were violated, a Kruskal-Wallis nonparametric test was conducted to determine whether the PTSD, GAD, and PHQ significantly differed between ACE groups. The results of the Kruskal Wallis tests are presented in Table 10. The results showed that there is a significant difference in

mean ranks of PTSD, GAD, and PHQ scores. Therefore, the nonparametric results were aligned with the MANOVA results, indicating that there is sufficient evidence to reject the alternative null hypothesis which stated that PTSD, anxiety, and depression scores do not significantly differ by ACE score.

Table 11

Kruskal-Wallis Test of Difference in Mean Rank between ACE Categories

	ACE Category	N	Mean Rank	Chi-square	Df	p-value
PTSD	0 ACE	218	256.24	80.76	2	0.00
	1-3 ACEs	252	290.03			
	4 or more ACEs	131	396.60			
	Total	601				
GAD	0 ACE	218	249.19	69.08	2	0.00
	1-3 ACEs	252	291.16			
	4 or more ACEs	131	406.15			
	Total	601				
PHQ	0 ACE	218	234.67	87.02	2	0.00
	1-3 ACEs	252	300.58			
	4 or more ACEs	131	412.20			
	Total	601				

The third aim of the study and second research question focused on determining whether ACE predicts PTSD while controlling for gender, ethnicity, TIS, and SES; the continuous ACE score was the independent variable, while the continuous PTSD score was the dependent variable. Control variables were gender, ethnicity, TIS, and SES. A hierarchical linear regression model was conducted to determine whether ACE was a significant predictor of PTSD. It was determined to use the PTSD scores as the constant because PTSD can capture a broader spectrum of participants experiencing distress. PTSD is an anxiety disorder (American Psychiatric Association, 2013) and has a high

comorbidity with depression with approximately half of individuals with PTSD clinically diagnosed with the condition (Flory & Yehuda, 2015; Roley et al., 2015). Additionally, the central focus of this study is the role of ACEs and individuals' chronic exposure to ACEs. Individuals with chronic exposure to ACEs may meet criteria for a complex post-traumatic stress disorder (CPTSD) diagnosis which pathogenesis originates in childhood as opposed to PTSD which develops from a specific traumatic event (Hyland et al., 2021).

In the succeeding models, gender, ethnicity, TIS, and SES variables were included. The result of the hierarchical linear regression analysis is presented in Table 11. The result showed that ACE significantly predicts the PTSD score. Gender was also a significant predictor of PTSD. For every increase in the ACE group, there was a .26 increase in the PTSD score in females service members. The VIF values are below 2.5, which indicated that there is no violation of multicollinearity. The Mahalanobis Distance for PTSD had a range of .62 to 31.73 with a mean of 4.99 (SD = 4.18). A total of five (n=5) responses were identified as outliers. The outliers remained for analysis to ensure every SM's perspective is included. The R squared values increased from .17 in model one to .18 in model five, indicating that the variance in PTSD explained by the model increased as the predictor variables were added into the model. The result showed that an increase in ACE grouping results in an increase of .28 in PTSD score. Therefore, there is sufficient evidence to reject the null hypothesis which stated that there is no linear relationship between the covariates in each model.

Table 12

Hierarchical Linear Regression Analysis of PTSD and ACE Total Scores

	Model 1	Model 2	Model 3	Model 4	Model 5
ACE	.28**	.27**	.26**	.26**	.27**
	(.02)	(.02)	(.02)	(.02)	(.03)
Gender		.25*	.25*	.26*	.26*
		(.11)	(.11)	(.11)	(.11)
Ethnicity			-.01	-.01	-.01
			(.04)	(.04)	(.04)
TIS				.01	.01
				(.01)	(.01)
SES					.07
					(.06)
r^2	**.17**	**.17**	**.17**	**.17**	**.18**
Adjusted r^2	**.16**	**.17**	**.17**	**.17**	**.17**
Standard Error of Regression	**1.41**	**1.41**	**1.41**	**1.41**	**1.41**

Table 13

Multicollinearity Statistics

	Tolerance	VIF
ACE	0.83	1.19
Gender	0.95	1.05
Ethnicity	0.99	1.00
TIS	0.97	1.02
SES	0.85	1.17

Summary

The purpose of this study is to describe the prevalence of ACEs in the military from a unique, non-clinical sample, determine if a SM's scores for PTSD, anxiety, and depression significantly differ from a SM's ACE score, and to determine if ACEs can predict distress. A total of 600 participants were included in the study. The result of the

ANOVA determined that there is no significant difference in total ACE scores of participants among the three branch categories. Therefore, there is insufficient evidence to conclude that there is a difference in total ACE scores between Army, Air Force, and Navy participants. The result of the MANOVA and the Kruskal-Wallis tests were aligned in supporting that, indeed, higher ACEs have increased PTSD, GAD, and PHQ scores. For the third research question, a hierarchical linear regression analysis determined that ACE and gender significantly predicts the PTSD score. The result showed that an increase in ACE grouping result to an increase of .28 in PTSD score. Moreover, the result showed that female service members had a statistically significant increase of .26 in PTSD score. Therefore, there is sufficient evidence to reject the null hypothesis which stated that there is no linear relationship between the covariates in each model.

Chapter 5 Discussion

This chapter discusses implications of the results presented in the previous chapter. First, findings from the primary and supplemental findings are discussed to address how the results either support, extend, or contradict those from previous literature. This chapter presents findings related to each hypothesis from Chapter Three. Next, limitations are reviewed, followed by the theoretical, research, and practice implications of the study. Finally, suggestions for future research within the realm of mental health care are presented.

Interpretation of Results

This study involved three aims and two research questions revolving around ACEs and the relationship of ACE scores to PTSD, depression, and anxiety in a military sample. A sample of 620 participants was included for the first aim of the study, with 600 participants completing responses for all variables for the remaining two aims and research questions. This section provides an interpretation of the results in this study.

This study contributes to the existing literature in military ACE research by providing evidence that mental health disorders such as PTSD, depression, and anxiety increase as a service member's (SM) ACE score increases. Thus, SMs' risk for mental health disorders may be proactively identified through efforts to screen for ACEs utilizing the questionnaire. Specifically, this study identified that SMs with an ACE score of four or more resulted in higher scores that indicate mental health impediments compared with SMs with zero ACEs or one to three ACEs. These results converge with those found in extant literature.

This study further bolsters military ACE research by including two commonly under-represented demographics in the military. This study included more senior ranking and female service member participants. However, both were overrepresented in this study. The percentage of officers is over twice the percentage (46.8%) compared to officers in active duty (18%). Likewise, females were overrepresented (37%) at nearly twice that of the female population in the active-duty (17%) military. The results of this study can aid in the development of policy or practice systems or interventions on how best to assist SMs who have experienced adverse events in their childhood.

Description of ACE

The first aim of the study focused on the rate of ACEs from a unique, non-clinical, US military sample using the original ACE questionnaire. The ACE scores in this study ranged from 0 to 10 with a mean of 1.97 (SD = 2.26). The mean score indicated that there were few adverse events for participants in this non-clinical, US military sample before the age of 18. In reference, the original Felitti (1998) ACE study involving 17,337 mostly middle-class adult Kaiser Permanente members determined that 67% reported at least one ACE category, almost 40% reported more than two ACEs, and 12.5% reported four or more (Felitti et al., 1998). In this current study, 36% reported zero ACEs, close to 64% of participants had at least one ACE category, 42% reported up to three ACEs, and 22 % of participants reported having four or more ACEs. Therefore, there was a similar percentage of participants with at least one ACE category while there was a higher percentage of participants with four or more ACEs compared to Felitti's civilian sample. This may imply that SMs who have ACEs are more likely to have experienced a higher number of traumatic events than US non-military individuals. This

study's results highlight the need to develop proactive support systems to reduce the health risks related to ACEs of SMs in the US military.

In reference to the military ACE literature review, an aggregated sample size totaling 91,837 SMs from prior military ACE studies indicated that over half to over three quarters (53- 83%) of SMs reported having at least one ACE, while the range of SMs reporting four or more ACEs was (7-40%). Interestingly, 64% of SMs reported at least one ACE. The results of this study converged with existing studies, given that SMs with one ACE were within the range of 53 to 83% and within range in terms of four or more ACEs. SMs with four or more ACEs were 22%.

It is concerning that the percentage of SMs with four or more ACEs from the non-clinical sample was 200% more than Felitti's sample and higher than many of the other non-clinical military samples found in the literature. This difference might be attributed to this study having an over-representation of female participants who also reported having more ACEs on average than male SMs. The inflated percentage of SMs with four or more ACEs might also be attributed to the sampling methods not being representative of the military. Nonetheless, the rate of SMs in this study reporting four or more ACEs is concerning.

Effect of ACE Scores on PTSD, Depression, and Anxiety

This study also compared ACE's groups and distress psychometric measures to determine which psychometric has the greater effect specifically in terms of PTSD, depression, and anxiety symptoms. The second aim and first research question focused on determining which distress scale between PC-PTSD 5, GAD-7 [anxiety], and PHQ-9 [depression] is highest based on ACE scores.

H_o: PTSD, anxiety, and depression scores do not significantly differ by an increase in ACE score.
H_a: PTSD, anxiety, and depression scores do significantly differ by an increase in ACE score.

The results determined that, within this sample, PTSD, anxiety, and depression symptoms were significantly higher for SMs with four or more ACEs, and depression was the highest across all ACE groups on average among the participants. Using the four-point cutoff score, the results align with existing literature that supports that SMs experiencing adverse events before the age of 18 experience negative effects on mental health, specifically in terms of PTSD, anxiety, and depression (Gahm et al., 2007). Comparatively, other studies did not report whether SMs with more ACEs also have higher PTSD and depression scores compared to SMs with no ACE score (Applewhite et al., 2016; Clarke-Walper et al., 2014; Gahm et al., 2007; LeardMann et al., 2010; Skopp et al., 2011). These results may serve as a guide for risk mitigation to determine whether an individual is at higher risk for mental health disorders such as PTSD, depression, and anxiety.

ACEs are a significant influence on an individual's health outcome (Alcalá et al., 2017; Burke Harris et al., 2017; Kerker et al., 2016). Literature has become saturated with studies supporting ACE's association with various adverse health outcomes that are often associated with SMs becoming non-deployable. Despite the substantial body of research on ACEs' health risks, there is a dearth of ACE research in the US military.

These findings about the difference in distress scores might be attributed to the timing this study took place. The primary recruitment of this study took place while many SMs were confined from travel, thus their distress scores could have been inflated due to historical events while being confined with reduced social interaction. Additionally, the

relationship between suicide and depression is well established. Regardless of what is contributing to distress scores, this study provides further evidence to support the utilization of the ACE questionnaire to identify high-risk SMs before they experience a clinically significant level of distress. The efficacy of the ACE questionnaire is discussed in the implications section.

ACE Scores Predicting Distress

The third aim of the study and second research question focused on determining whether ACE scores can predict PTSD scores while controlling for demographics such as gender, ethnicity, time in service, and socioeconomic status. The results showed that the ACE score was a significant predictor of PTSD scores even after controlling for all the effects of the demographic characteristics. The results showed that ACE scores significantly predict PTSD symptoms among SMs. Gender was also determined to be a significant predictor of PTSD based on the hierarchical regression analysis. The result showed that females had a statistically significantly higher average PTSD score. The result of the hierarchical regression supported the second hypothesis, that as SMs' ACE scores increased, PTSD scores significantly increased. Therefore, this study's findings determined that a SM's ACE score predicts PTSD scores while controlling for the covariates in the hierarchical regression analysis.

Limitations

This study has several limitations. The study participants were not selected randomly; thus, the generalizability is limited. Although the participants' recruitment came from 17 social media sites across the US and international locations affiliated with the military, the sample is not a random and representative sample of all service

members. Despite a majority of sites being closed groups, it was possible for non-military members to access the social media sites. The generalizability problem plagues extant military ACE literature because official access to study service members is cumbersome, with multiple barriers in play. For this reason, it is not a coincidence that ACE researchers who want to study SMs have had difficulty gathering a representative probability sample of SMs to determine the actual prevalence of ACE in the military. A representative sample would include all military branches, military occupational skills (MOS), genders, ranks, ethnicities, and ages. This exploratory study does not meet that stratified quota as it overly represents female and officer participants.

Additionally, the method to recruit participants for this study limited the generalizability. The primary recruitment method utilized social media sites affiliated with all branches of the military to solicit participants. Only those SMs with access to the social media sites and access to personal electronic devices could participate; thus, all SMs were not available for the study. The Navy, Marine, Coast Guard, and Space Force were most underrepresented in this study. The attributed reason for the lack of representation from those branches could be due to a dearth of social media sites available to the military branches. The author asked SMs at local recruiting offices about specific social media sites connected with their respected military branch. Those SMs could not recall social media sites affiliated to their branch other than ones already known and contacted. Additionally, the Army and Air Force had the most social media sites and had a larger group of followers. For example, one social media site affiliated with the Army has over 1.3 million followers.

Another methodological limitation is that the study design is cross-sectional. It is important to be cognizant of the predictive limitations of cross-sectional studies because the primary limitation of the cross-sectional study design is that the exposure to ACEs and outcome of distress are simultaneously assessed. Despite evidence from this study to support the associated effects between ACEs and distress, without longitudinal data to support predictive claims, it is not possible to establish a true cause and effect relationship between ACEs and distress, and results should be treated with caution. Therefore, it is difficult to draw predictive conclusions based on these differences. Additional data from several time points in SMs' liveswould help to clarify the factors that cause distress and the relationship with ACEs. Additionally, the recruitment of participants took place March-August 2020 during the climax of the COVID-19 pandemic and could have skewed the results for distress scores. Many SMs were in quarantine and lockdown (Hall et al., 2020) during the first three months of participant recruitment. The survey should have included a question inquiring how COVID has affected the participant. Despite other studies using age as a covariate, the author used time in service (TIS) instead of age as a covariate due to multicollinearity. TIS can provide evidence about attrition, whereas age cannot.

A final limitation of this study is the self-reporting nature of all measurements. Researchers do not know the extent of the reliability of respondents' answers. Additionally, participants that completed the self-report questionnaires could be those most willing and not representative of the population because of social desirability; the use of self-reporting measures tends to inflate correlations. Social desirability remains a

limitation, although the study was anonymous, and participants were not proximal to researchers for them to influence participants.

Implications

This study's findings have significant implications for health care clinicians working with SMs and those in positions that influence policy. Contextually, the suggestions for this study's findings are specific to military health care clinicians, those who formulate US military policy, and US commanders. Each of the suggestions in this section reflects considerations related to either policy or practice. As mentioned earlier, having ACEs is not deterministic to having negative health effects. Early mitigation and protective factors are crucial to reverse the effects of ACEs to enable individuals to thrive. Examining these mitigation and protective factors with implications to future directions for clinical practice, policy, and research are suggested below.

The literature review highlighted the life course health development model which indicates that an individuals' current physical and mental aliments are vestiges of negative childhood experiences (Halfon et al., 2018). This appears to be especially true as well for SMs that reported distress scores with four or more ACEs. In this study the mean scores from SMs reporting zero ACEs compared to SMs reporting four or more ACEs for anxiety increased 222%, depression 268%, and PTSD 433%. These results indicate a need for a cultural shift to focus on preventative efforts and implement a daily routine for mental and emotional health techniques and procedures. Having a daily routine will help improve mental and emotional benefits for SMs with *and* without ACEs. A growing body of literature has shown that these preventative efforts are effective in other populations to reverse the effects of ACEs (Burke Harris et al., 2017; Felitti, 2019; McClelland et al.,

2018; Nakazawa, 2015; Van der Kolk, 1994). Many of the negative effects are the same ailments that might label a SM non-deployable.

Benjamin Franklin eloquently stated, “An ounce of prevention is worth a pound of cure” (Franklin, 1734, p. 1). Cox (2018) noted a policy instituted by the US military known as *deploy or get out* effectively reduced non-deployable (ND) numbers; however, the policy neglects the underlying reasons for the SMs’ behaviors and other manifesting symptoms causing them to become ND. To this end, Franklin added, “where would be the damage, if, to the act of preventing…” (Franklin, 1734, p. 1). An overarching military policy to utilize the ACE questionnaire to screen SMs might be a method to identify SMs who are more susceptible to becoming ND. The questionnaire should not be used to screen out potential recruits *before* entry into the service, but *upon* entry into the service, so that targeted prevention measures might be implemented.

The US military needs to ensure that current policies reflect current best clinical practice guidelines. Current civilian practices report early screening with the ACE questionnaire as a central tenet for prevention in the campaign to shift from a reactive to proactive treatment model (Halfon et al., 2018). Literature supports early screening for ACEs as a best practice (Burke Harris et al., 2017; Halfon et al., 2018), and more importantly, and as stated earlier, many health organizations and institutions such as AAP, SAMHSA, WHO, and CDC suggest screening early as a best practice to identify emerging indicators of ACEs’ adverse effects. Some researchers have suggested screening as early as preconception when planning for pregnancy (Fraser et al., 2018). A standardized ACE screening protocol in the military can be easily implemented.

Since the LCHD model and attachment theory assert in tandem that emerging adulthood is a critical development stage (Halfon et al., 2018; Wood et al., 2018), screening for SMs can take place upon initial entry into the service. The emerging adult age group begins at age 17-18 and ends in the mid to late ’20s, which is the same age group that consists of the larger population of the US Armed Forces. Therefore, employing a policy to screen and treat SMs upon entry could decrease ND numbers and increase well-being. Once screened, the SMs could then receive a referral for treatment.

Another tenet for preventative efforts involves a routine to improve self-regulation and emotional intelligence by teaching coping skills preemptively once at-risk SMs are identified. Duckworth et al. (2014) emphasized the role of emotional self-control, self-regulation, and grit as determinants of success. Researchers reported success as the ability to complete goals and the ability to achieve goals increases as self-regulation, self-control, and grit increase. The capacity and ability to control emotions, attention, and behaviors is self-control (Duckworth & Gross, 2014; McClelland et al., 2018).

Other researchers connected another relationship of success similar to self-control, self-regulation, and grit. Libbrecht et al. (2014) reported that medical students with higher emotional intelligence were more successful in graduating medical school than students with lower emotional intelligence. Coincidently, a crucial dimension of emotional intelligence is emotional regulation (Libbrecht et al., 2014). Lastly, a well-known theologian stressed the importance of attitude [a reflection in behavior in how one feels], stating, “I am convinced that life is 10% what happens to me and 90% how I react to it… and so it is with you, we are in charge of our attitudes” (Swindoll, 1999). The

abilities of self-regulation, self-control, grit, emotional intelligence, and attitude culminate to suggest that mental and emotional fortitude and intelligence are fluid and possibly taught if correctly practiced routinely.

It is well known that the US Armed Forces emphasizes optimal physical fitness. SMs must be physically fit given the current operational demands for protracted training exercises and deployments. The US military has regulations stating that SMs must maintain a certain level of physical fitness and expects SMs to routinely conduct regular physical fitness training (Poston et al., 2017). However, there are more than physical requirements demanded in combat and training. Previous chapters documented the mental and emotional fortitude necessary during combat, peacekeeping deployments, or prolonged training exercises. There remains a high rate of SMs becoming non-deployable due to mental health impediments and high non-combat related medical evacuations on deployments when the SM's fortitude collapses (Applewhite et al., 2016; Arnold et al., 2011; Cronrath et al., 2017). The findings from the literature review and analysis in this study suggest a need in a cultural shift away from the status-quo, from a preoccupation with regular physical fitness to a routine that implements mental and emotional practice routines.

The US military may need policy and regulation for a regular regime of mental and emotional training supervised by qualified SMs. Ideally, the training could be conducted by embedded medics or corpsman in each unit. The Army currently has a course intended to bolster SMs' resilience and to help destigmatize behavioral health called master resiliency training (MRT), (Casey, 2011). However, the course is conducted hastily and on an annual basis, and until training becomes a daily or weekly

regime, it will produce minimal effects. Having policy and regulation to implement a regular regime, such as MRT, supervised by qualified personnel could promote a "thriving" environment (Halfon et al., 2018, p. 42). Additionally, the policy might reduce the stigma surrounding receipt of behavioral health interventions by making preventive behavioral health services a customary part of the SMs routine. The policy and practice could help to normalize behavioral health.

These policy and practice implications coalesce to promote an environment to screen, treat, heal, and thrive. For instance, once a SM becomes identified through screening upon entry into the service, the SM can see their primary care physician to receive a referral for preemptive treatment, receive adequate time to heal, and be placed on a health trajectory to thrive. This proactive approach addresses the concerns to destigmatize behavioral health, shift toward becoming more proactive, focus on prevention, reduce non-deployable SMs, and improve the quality of life of our SMs who protect our liberty.

Future Research

Though the evidence in this study converges with extant literature regarding the relationship between ACEs and distress, ACEs' prevalence in the military remains indeterminate. The DoD *must* pursue research studies to determine the prevalence of ACEs among SMs. Future studies should focus on probability sampling strategies to adequately represent each branch of the US military or the US military as an entity.

Another future area for study are non-deployable SMs due to the military's deployment modification operation order regulations (MODS) that dictate what health impediments are acceptable to have for a SM to deploy. The study can investigate ND

SMs and their rate of ACEs to research if a relationship exists between ACEs and ND services members. Methodologically, researchers could analyze the SMs not identified as ND as a control between the groups. The findings could bolster the argument that the ACE questionnaire's utility and efficacy is an effective screening tool to identify high-risk SMs.

Similarly, with the findings suggesting a significant difference in PTSD scores between gender, a more extensive analysis to further investigate what mediating or moderating factors influence the difference is warranted. One factor that may explain the difference is that the military, in general, is a male-dominated patriarchal organization. Females may feel uncomfortable, causing them to increase their hypervigilance, which is one criteria of post-traumatic stress. Additionally, females are now integrated into the combat arms which again needs to be further analyzed if the integration process plays an influential role in PTSD or other distress scores. A female support group could help mitigate uncertainty or uneasiness for other female SMs coming into the service.

In addition to investigating the relationship between ACEs and risk for SMs becoming non-deployable SMs, a pilot program to monitor SMs in a longitudinal research study could explore the effects of ACEs on SMs over time. Such research could track at a minimum non-deployable rate, the health, behavior, and retention trends of SMs with and without ACEs. The pilot program would entail a randomized control study while SMs complete the questionnaire upon entry into the service. The SMs would divide into two groups: treatment as normal and an experimental group. The treatment as usual group would receive reactive care when a SM comes to seek treatment, whereas the pilot program experimental treatment group would receive preemptive care and empirically

supported treatments found to be successful in other populations (Burke Harris et al., 2017; Felitti, 2019; McClelland et al., 2018; Nakazawa, 2015; Van der Kolk, 1994). Conducting a longitudinal study could provide additional empirical evidence to the efficacy and utility of employing the ACE questionnaire as a screening instrument.

Summary

Based on the preceding discussion, several conclusions drawn with empirical support are presented. The study's first aim was to capture the rate of ACEs from a non-clinical sample that included more female and officer participants. The rate of ACEs fell within the range as found in previously surveyed samples. Remarkably, the percentage of SMs with four or more ACEs (22%) is almost twice that of Felitti's (1998) study, with civilians having four more ACEs was (12%). Although the findings in this study are not generalizable to the US military population, the empirical evidence supports the assertion that future researcher is needed to determine the prevalence of ACEs within the military population.

It was also concluded from the second aim and hypothesis stated in Chapter 1 that a SM's distress scores differs in relation to their ACE score in the current sample. The relationship between adverse mental health outcomes and ACEs in this study is consistent with extant literature. This study, with a non-clinical sample, showed that SMs with four or more ACEs reported PTSD, depression, and anxiety scores on average, three times that of SMs with no ACEs.

The US conflicts are seemingly endless, but they will eventually subside. However, the battle of suicide, physical and mental health impediments, and destructive behaviors in the military will endure until the DoD wholeheartedly commits to a

prevention-based model similar to those successfully employed in the civilian sector mentioned above. Additionally, the Life Course Health Development model and attachment theory help explain the pathogenesis of SMs becoming non-deployable due to behavioral health impediments.

This study determined a strong relationship between the certain determinants of SMs becoming non-deployable, specifically PTSD, depression, anxiety, and their rate of ACSs. These findings also provide evidence to support the notion that the increase in distress scores on a SM's allostatic load places them on a health trajectory to becoming non-deployable. If the DoD employs the proactive implications, it could lead to long-term outcomes of thriving SMs across physical, behavioral, social, mental, and emotional health outcomes. The suggested implications are not a panacea to the DoD's non-deployable problem; however, they are viable solutions to render to their benefit and aid.

Appendix A

Literature Review Matrix

Title Author/ Date	Study Design/ Methodology	Measure/ Study Setting	Number of Participants	Intervention/ Independent Variables	Analysis	Finding/Outcome/Dependent Variables
Alcohol misuse, alcohol-related risky behaviors, and childhood adversity among soldiers who returned from Iraq or Afghanistan by Clarke-Walper, K. (2013)	- Quantitative Survey -Cross-sectional study	The main variable of specific interest for this research paper was: (1) combat exposure, (2) mental health challenges and finally (3), ACEs.	The total sample respondents for this research study consisted of (n=8871) different soldiers sourced from the brigade combat teams.	- The main variable of specific interest for this research paper was: (1) combat exposure, (2) mental health challenges and (3) ACEs -The demographic measures were the main risks of bias for instance: (1) education, (2) gender, (3) rank and (4) gender	1) separate logistic regressions adjusting for the demographic covariates (age, gender, rank, and education) and 2) three logistic regression models were constructed to	-20% of the respondents reported having a depressed or mentally ill person living in the home. - 32% reported having a problem drinker or alcoholic in the home. -18% reported mother being pushed, grabbed, slapped or something thrown at. -21% reported being sworn at, insulted, or put down.

					determine which of the ACE variables were independently associated with each outcome. Model 1 ACE variables; Model 2 ACE variables adjusting for the demographic covariates; and Model 3 adjusted not only for the demographic covariate	-14% reported being pushed, shoved, slapped, or something thrown at. - 5.5% reported being sexually touched. -17 screened positive for a mental health problem. -All ACE items were associated with a 1.3 to 1.9 times greater likelihood of meeting criteria for alcohol misuse.

					s but also for combat exposure and mental health problems.	
Exploring the Prevalence of Adverse Childhood Experiences in Soldiers Seeking Behavioral Health Care by Applewhite, Arincorayan, and Adams (2016)	Mixed-method secondary data analysis on the data obtained from two (2) different studies of the data obtained from two separate studies that were done	This research study was mainly performed based on the data obtained from the clinical health records, which also had inherent limitations. The first significant challenge is	This study focused on reviewing a total of (n=162) different clinical samples. Moreover, out of the (n=162) clinical samples, about 83% also 135 clinical samples reported at least one ACE.	The main variable of specific interest for this research paper was: (1) combat exposure, (2) mental health challenges and finally (3), ACE (Adverse Childhood Experiences).	The scores for adverse childhood experiences ranged from 0 to 9. The clinical samples (n=162) also had a total mean value of 3. It also had a standard deviation value of 2.4.	40% (n=65) of the obtained sample (N=162) experienced four or more ACEs and that they were directly associated with witnessing increased instances of domestic violence in their household or having one family member with a drugs and substance abuse problem.

	based on retrospective reviews of the health and medical records of soldiers deployed in Afghanistan and Iraq - Records Retrieval study	selecting the intrinsic risk of bias in using the clinical study samples. Additionally, the risk of bias exists in utilizing the retrospective data collected using the self-reported ACE questions.			Additionally, the whole clinical samples (n=162) also had a mode value of 0. -chi-square test for independence to examine whether relationships existed between the demographic variables, chief complaints, and an individual's exposure to ACEs	

Childhood Abuse and Parental Disorders Reported by Navy Outpatient Mental Health Patients by (Dansak, 1998)	A quantitative research study that collected information using data forms that were administered to the patients in the Navy. - Longitudinal research study	The researchers mainly focused on reviewing the number of respondents who reported a type of ACE, for instance, emotional, verbal, sexual, or physical.	This research done by (Dansak, 1998) focused on reviewing (n=134) different clinical data forms that were allocated to the patients.	Re-victimization, violent behaviors, poor or low self-esteem, interpersonal challenges or difficulties, suicide attempts or threats and increased depression	- Descriptive statistics	This research study focused on reviewing a total of (n=134) different clinical data forms that were completed by the patients. Ideally, the author (Dansak, 1998) revealed that more female soldiers in the Navy reported at least one type of adverse childhood than their male counterparts. Moreover, the respondents revealed that the assailants were the male father figures or stepfathers in their lives. The female respondents indicated that they increasingly suffered from verbal,

						psychological, and physical abuse, which frequently affected their childhood happiness. -Moreover, the author (Dansak, 1998) also informed that the divorce, mental illness, and drug or substance abuse for the parents that occurred before the child attained the age of 19 years also reduce the happiness of the children while abuse at the homestead further reduced the children's happiness.
Childhood Abuse and Sexual Revicti	- A quantitative research design	-The researchers aimed at examining the	-The authors Merrill, L., L., (1999), surveyed	-Female Navy recruits who had been raped -Female navy recruits who experienced CSA also adverse childhood sexual abuse	-Chi-square assessing relationship of ethnic	-The findings of this research study by Merrill, L., L., (1999), reveal that 35% of the female

mization in a Female Navy Recruit Sample by (Merrill et al., 1999).	through the use of surveys -Cross-sectional research design	effects of the adverse childhood abuse on the adult rape incidences	a sample of (n=1,887) navy recruits (gender=female)		groups and CSA	respondents (Navy recruits) had been raped. -The findings reveal that 57% of female navy recruits had experienced (Childhood Physical Abuse) also CPA -This study also revealed that 57% of the female navy recruits had experienced CSA also Childhood Sexual Abuse.
Childhood adverse life events, disordered eating, and body mass index in US	The authors Bakalar et al., (2018), conducted a quantitative research study through the use	Bakalar et al. (2018) aimed to examine the existence of multiple cases or indices of childhoo	Bakalar et al. (2018) identified (n=179) respondents to participate in the Life Stressor Checklist.	The study measures included demographics variables, body mass index variables, eating disorders, depression, trauma, and ALE measures.	Multiple regression to analyze childhood ALE with the help of the LSC also Life Stressor Checklist.	The findings by Bakalar et al. (2018) revealed that among the (n=179) study respondents, several or multiple cases or indices of childhood ALE were directly related to obesity and the eating

Military service members by Jennifer L. (Bakalar et al., 2018)	of "online survey studies" that was administered to (n=179) respondents. -Cross-sectional Research Study	d ALE and how these incidences were associated with eating disorders.					disorders. Moreover, the researchers Bakalar et al. (2018) also revealed that the traumatic incidences of ALE at childhood and its impact were directly related to high BMI among the respondent.
Childhood Adversity and Combat as Predictors of Depression and Post-Traumatic Stress in Deployed Troops by	A quantitative research study aimed at examining the rate of ACE on the male soldiers deployed to Iraq	- Modified ACE (6) -PHQ -PCL	The researchers' Cabrera et al., (2007) revealed a total of (n=4529) soldiers for the pre-Iraq sample population. Moreover, Cabrera et al., (2007)	ACE predictors of PTSD, and depression.	The post-Iraq sample revealed the existing relationships between combat and ACE while predicting the posttraumatic and		-The findings revealed 53% reported at least one ACE, and 7% reported four or more ACEs.

Cabrera et al., (2007)	and those who were not deployed. - Longitudinal Research design.		identified a total of (n=2392) for the pre-Iraq sample population.		predicting depression using multivariate regression.	
Childhood Adversity and Suicidal Ideation in a Clinical Military Sample: Military Unit Cohesion and Intimate Relationships as Protective Factors	- The authors Skopp, A., N., (2011) conducted a longitudinal, quantitative research design	-This study by Skopp et al. (2011) used the "ABHC's computerized questionnaire for screening the intakes - Screening for cases of Childho	This research aimed at evaluating the protective and suicide risk factors on a representative sample of (n=5187) -The selected sample population was on	-Childhood adversity -Suicide ideation -relationship, legal, financial, work and legal problems -Psychiatric disorders, for instance, PTSD, depression, alcohol abuse	Conducted a multiple regression analysis to assess whether childhood adversity predicted suicidal ideation over and above proximal risk variables (i.e.,	The findings revealed by Skopp et al. (2011) reveal that childhood adversity was a key factor or variable in predicting the ideation of suicide, as revealed by the sample respondents. -Moreover, the same findings also replicate even after this study factored in control variables

by (Skopp et al., 2011)		od trauma - Screening for mental health problems - Psychosocial history - Demographic information - Military history - Reasons for clinical visits	active-duty SM's who turned up at an established behavioral military health clinical facility		intimate relationship, legal, financial, and job problems), PTSD, depression, and alcohol abuse, and whether military unit cohesion and intimate partners moderated the association between childhood adversity and suicidal ideation.	like PTSD, depression, financial stress, work challenges, and finally, legal challenges. -Additionally, this research also revealed that the adverse childhood experiences were higher among the SM's who had reported previous cases of deliberate suicide attempts - All values fell within acceptable limits of multicollinearity.

					- conducted multicollinearity diagnostics	
Do adverse childhood experiences increase the risk of post deployment posttraumatic stress disorder in US Marines? by (LeardMann et al., 2010)	- Quantitative, cross-sectional research design -Patient medical records were used to determine diagnosis for PTSD, and other mental health similar	7 ACE categories were assessed in the current study: (1) physical neglect (lack of care and protection), (2) emotional neglect (lack of feeling loved), (3) physical abuse	The researchers obtained information from (n=8,391) different military recruits who managed to complete the RAP survey in the initial parts of the training.	The RAP survey was instrumental in including various questions on mental health history, alcohol use, ACE, tobacco use, family history, health, and demographics.	Chi-square statistics, were effectively performed to model the relationship between PTSD and ACE. - multivariable modeling was adjusted for covariates that	- Researchers revealed that 19.6% reported at least one ACE - 11.6 reported two or more ACE Moreover, a large proportion of the responders diagnosed with PTSD scored very low for the AFQT. They also reported having very few close friends and poor mental health situations at the beginning of their military or army training.

	to PTSD.	(pushed, grabbed, shoved, or slapped), (4) emotional abuse (was sworn at, insulted, or put down), (5) sexual abuse, (6) domestic violence, and (7) family history of mental illness or alcohol abuse			were significantly associated with the outcome or confounded the relationship between ACE and PTSD, all other variables were removed from the multivariable models	
Prevalence, Correlat	The authors conduct	This study aimed at	The researchers, Taylor	Taylor et al. (2016), aimed at analyzing the relationship between the "insomnia group" and other symptoms like low levels of unit cohesion,	Chi-square	According to Taylor et al. (2016), findings

es, and Predictors of Insomnia in the US Army prior to Deployment by (Taylor et al., 2016)	ed a quantitative cross-sectional cohort research design that aimed at evaluating Insomnia among other psychological variables and attributes like depression, anxiety, headaches among their active-	evaluating the measures of psychosocial and Insomnia variables to include Beck Anxiety Inventory to measure anxiety, Beck depression inventory, PTSD-M, Army Institute cohesion scale, AUDIT, The State Trait	et al. (2016), identified a total of (n=4,101) sample respondents who were representative enough to represent the general population's ideologies. The respondents (n=4101) were identified at "Fort Hood" in Texas before they were deployed.	social support and resilience, the prevalence of child abuse, stressful life situations and mental health challenges like depression.	tests of independence and analyses of variance - logistic regression analyses were performed to examine the relationships between insomnia and clinically significant physical and mental health problems - To determine which clinically	from the sample population (n=4101) revealed that the enlisted were five (5) times more likely to experience Insomnia as opposed to other officers. - The Insomnia Group reported more severe mental health symptoms, more recent stressful life events, greater childhood abuse, and lower levels of trait resilience, social support, and unit cohesion (Cohen ds = 0.27–1.29). After controlling for covariates, the Insomnia Group was more likely to have a

	duty SMs service members.	Anger Expression Inventory (STAXI) state anger scale, PHQ-15, DVBIC for head injuries, The Psychiatric Epidemiology Research Interview Life Events Scale, CTQ, The Interpersonal Support Evaluation List-Short Form			significant correlates were most closely related to insomnia status, a simple logistic regression was performed, with insomnia (yes or no) entered as the dependent variable and significant variables from the chi-square, analysis of variance,	history of head injuries and clinically significant PTSD, anxiety, depression, alcohol use problems, back pain, extremity pain, headaches, and fatigue (ORs = 1.40–3.30)

Prevalence of Childhood Trauma Among US Army Soldiers with Suicidal Behaviors by (Perales et al., 2012)	Ideally, the researchers conducted quantitative research to identify the prevalence of a history of childhood trauma from reviewi	(ISELSF), and The Response to Stressful Experiences Scale (RSES) The prevalence rates and descriptive statistics were effectively analyzed and calculated for the increased rate of childhood trauma experienced among	The researchers identified a total of (n=2,803) respondents who participated in this research study. Moreover, the research data was obtained from the ABHIDE also Army Behaviora	The researchers aimed at identifying the prevalence of a history of childhood trauma from reviewing the DoDSERs to determine if a soldier had previously experienced forms of childhood trauma.	and adjusted logistic regression analyses entered simultaneously as the predictor variables Descriptive statistics and prevalence rates were calculated for childhood trauma among Soldiers. Pearson Chi-square test and Fisher's exact test were used for	The individual soldiers who displayed suicidal behaviors were the White soldiers who had lower ranks, and about half of the respondents were deployed once during their service. According to the authors, the increased prevalence of childhood trauma was 64.7% higher than in the cases of suicide.

	ng the DoDSERs from 2005-2010. - Secondary data analysis	the soldiers or service members SMs.	l Health Integrated Data Environment, the BSHOP also Behavioral and Social Health Outcomes Program located at the "US Army Institute of Public Health," also USAIPH.		bivariate analysis.	Moreover, the increased suicidal attempts were higher (29.2%) for the respondents who reported experiencing a history of childhood trauma incidences.
Relative Impact of Adverse Events and Screened Symptoms of Posttraumatic	Quantitative research study - quantitative Cross-sectional researc	The primary purpose of this research was to evaluate how the demographics contributed to	The researchers identified a total of (n=1,626) of the patient files from the total (n=1,714) patient	The predictor variables for the first model: age, gender, ethnicity/race, military status, and rank. The following predictors were entered into a second model: combat/war experience, natural disaster experience, witnessing of other person being assaulted or killed, and childhood adverse events (total ACE score).	-Chi-square - Multivariate regression	39.4% reported no adverse experiences, 21.3% had ACE scores of 1, 16.8% reported two ACEs, 10.9% reported three ACEs, 6.3% reported four ACEs, 3.7%

Stress Disorder and Depression Among Active-Duty Soldiers Seeking Mental Health Care by (Gahm et al., 2007)	h design - Records Review between June 2003 and Oct 2004	the adulthood and childhood trauma on the screened depression and PTSD symptoms among the soldiers.	records available for the variables included in this analysis.			reported five ACEs, and 1.6% endorsed all six ACE items - The model was significant for PTSD, with the experiences of combat (Odds Ratio [OR]=2.09), witnessing someone being assaulted or killed (OR_1.88), and number of adverse childhood events (OR_1.25) emerging as significant risk factors. Witnessing someone being assaulted or killed (OR _ 1.56) and number of adverse childhood events (OR _ 1.34) significantly

						predicted screened depression status above and beyond demographic factors, although exposure to combat did not emerge as a significant predictor in this model
Resilience-Enhancing Relationships: What We Can Learn from Those With a History of Adverse Childhood Experiences by (Arincor	- Mixed-methods -A cross-sectional research design - Semi-structured interviews - Inclusion criteria	- The relationship between ACE and resilience in adulthood - identify characteristics of supportive relationships that contributed to	A convenience sample of (n=250) active duty SMs was recruited at Soldier Readiness Processing Center at Schofield Barracks located in Hawaii. For the qualitative study (n=25).	The questionnaire about ACE was utilized to capture the (n=250) sample's ACE exposure before they reached 18 years, child maltreatment, divorce or parent separation, living with a mentally ill person in the homestead, drug and substance abuse in one of the parents or a parent was incarcerated	- Coding - Chi-square - Multiple Regression	- A weak but statistically significant negative relationship was found between total number of ACEs and current resilience as measured by the CD-RISC (r=-.138, P=.029). - The scores of ACE ranged from 0-10 with an (s.d.=2.6) - Scores on the CD-RISC ranged from 34 to 100

ayan et al., 2017)	for the qualitative portion of the study consisted of reporting at least 3 adverse childhood experiences, demonstrating high resilience as evidenced by scoring 80 or higher on the CD-RISC	individuals becoming resilient adults despite childhood adversity				with a mean of 78.28 (SD=13.74) -The ACE's may lead to the adults being plagued with several psychosocial and physical maladies - An individual's spouse (44%) or mother (24%) were the most frequently identified current sources of support followed by extra-familial relationships with peers or supervisors such as their platoon sergeant (20%). Some (12%) reported gaining strength from their relationship with a spiritual or religious entity

Risky Alcohol Use, Age at Onset of Drinking and Adverse Childhood Experiences in Young Men Entering the US Marine Corps by (Young et al., 2006)	- Quantitative Survey - Longitudinal research design	-Alcohol Use Disorders Identification Test (AUDIT) -ACE - Childhood Trauma Questionnaire (CTQ) - Conflict Tactics Scales (CTS)	This research study identified (n=41,482) respondents to participate in this study.	-Childhood experiences -Risky underage drinking	- Univariate analyses, including _2 and measures of association, were performed to assess the significance of associations between exposures of interest and risky drinking. - Multivariate Logistics Regression Models to determin	- Out of (n=41,482) respondents, (n=6,128) were risky drinkers while (n=18,693) were non-risky drinkers - Risky drinkers were more likely to be smokers, from a rural or small hometown background, to have grown up with someone who was a problem drinker or alcoholic or who was depressed or mentally ill, and to have experienced childhood sexual or emotional abuse. - Factors inversely associated with risky drinking were

					e the odds of an outcome of risky drinking using 2 comparisons. Odds ratios and 95% confidence intervals were calculated for Marine recruits with complete covariate data.	being married, attending religious services weekly or more often
Sleep disturbance mediates adverse childhood experien	- Quantitative -Cross-sectional researc	-This research aimed at evaluating how sleep disturbance	- (n=759). Soldiers completed surveys while attending	-Prevalence of the ACEs among the SM's (Service Members), Disrupted sleep, Functional impairment, Poorer mental health	- Structural equation modelling - Descripti	- Sample A, ACEs mean and 2.37 (SD=2.84), Sample B mean 1.51(1.27) -The identified sample (n=759) respondents

ces with mental health symptoms and functional impairment in US soldiers. By (Conway et al., 2020)	h design -Self-administered surveys	mediates the association of ACE with functional impairments and mental health symptoms of the soldiers in the US. -ACE - Insomnia sleep index - PHQ-9 - GAD-7 - PCL-5 - Walter Reed Functional Impairment Scale	DLIFLC and Defense Language Institute Foreign Language Center located in Monterey, CA. -(n=410) soldiers completed self-administration surveys following Deployment to Iraq and Afghanistan approximately six months postdeployment		ve statistics	revealed that there was an indirect effect of ACEs on the mental health of the respondents through the sleep period that was distributed. -The identified sample (n=410) revealed an indirect effect of the ACEs on the functional impairment and mental health outcomes

The Association Between Childhood Physical and Sexual Abuse and Functioning and Psychiatric Symptoms in a Sample of US Army Soldiers by (Seifert et al., 2011)	- Quantitative -Cross-sectional research design -Self-administered surveys	- 2 items from Bernstein et al.'s Childhood Trauma Questionnaire - Childhood sexual abuse was assessed using 4 items from the Childhood Trauma Questionnaire's sexual abuse subscale	- This research identified (n=204) soldiers who were station at the Southern US Army facility	-Abusive childhood experiences among the active-duty SM -Psychiatric and functioning symptoms among the active-duty SMs	- ANOVA for associations between functioning and mental health symptoms and the ordinal categories of childhood abuse -Chi-square the percentage of participants who met "survey criterion" for PTSD, depression, and	-46% of individuals reported childhood physical abuse alone, whereas 25% reported both childhood physical and sexual abuse. -PTSD was increasingly elevated for those who reported sexual abuse and physical childhood experiences

					problem drinking according to childhood abuse category.	
The Impact of Childhood Abuse and Combat-Related Trauma on Post-deployment Adjustment by (Fritch et al., 2010)	- Quantitative Retrospective research study - Hierarchical multiple regression analysis - Longitudinal Research design	-ACE -Combat trauma - questionnaire included childhood trauma, combat exposure, and mental health symptoms. - Additional screening measures assess	A total of (n=1,045) activated reserve, or active-duty respondent attended the qualitative retrospective review research -The (n=1,045) respondents were OEF veterans and National Guard OIF	-Impact of physical childhood abuse -Combat-related trauma -Active-duty post-deployment adjustment	- Multiple regression to evaluate the effects of trauma-related to the combat and CPA on the use of alcohol among the service members, PTSD, depression, and anxiety.	- CPA and combat exposure were not associated with alcohol use, and no childhood physical abuse by combat exposure interaction was found. -High levels of combat exposure and CPA predicted the symptoms of PTSD -This research did not find any relationship between combat exposure and childhood physical abuse

		psychosocial history, and military deployment history				-R2 = .01 for Model 1; _R2 =.08 for Model 2 (p < .01); _R2 =.00 for Model 3.
The Measurements of Childhood Trauma among Male and Female Soldiers in the US Army (Rosen & Martin, 1996)	-A quantitative research study using the Childhood Trauma Questionnaire (CTQ) -Cross-sectional research study	-Psychological symptoms were assessed by the General Severity Index(GSI)	-A total sample of (n=1,365) respondents -completed a Childhood trauma questionnaire (CTQ)	-Emotional neglect -Emotional and physical abuse -Sexual abuse -Physical neglect	-ANOVA for GSI scores to compare across groups defined by self-reported abuse history.	-Half of the female respondents in a total of (n=1,365) respondents reported a history of childhood sexual abuse compared to the male soldiers. -Half of the male soldiers reported a long history of physical abuse -The abused soldiers reported increased psychological symptoms

The Relationship of Childhood Abuse and Early Separation from the Military Among Army Advanced Individual Trainees by (Patrick et al., 2011)	-A quantitative research. -Secondary Research design -Records review from Jan 2008-March 2008.	- TBHC intake form included data such as demographic identification, history of mental illness, history of substance abuse, history of childhood abuse, and the presence of suicidal and homicidal ideations.	A total of (*n*=569) different patients participated in the TBHC intake form from January 2nd, 2008 to 31 March 2008	-Determining if AIT trainees reported history of child abuse -Evaluating AIT population was consistent with findings of increased discharge rate in the basic training population - Identify whether any gender differences in the individual types of abuse that were reported from the Army during AIT	-Chi-square	- Of the males, 29.5% had an abuse history compared to the 55.8% of females -The women reported more abuse than the male respondents in all three (3) categories -There was a significant and direct relationship between gender and childhood abuse ($p<0.01$) in all childhood abuse categories. -The findings were inconsistent within existing research

Childhood Exposure to Family Violence and Attrition in the Navy by (Merrill et al., 2004)	- Quantitative study - recruits for the Navy at the Navy Recruitment Training Center from 1996 to 1997 -Cross-sectional research	-CSA was assessed using a modified version of the sexual events questionnaire. -CPA was assessed using the PC-CTS - Conflict tactics scale (CTS)	A sample of (*n*=5,491) of the recruits from the US, Navy	-Childhood exposure to household or family violence -New Navy Recruits from 1996 to 1997	- Multiple Regression assessing the relationship between childhood exposure to the household or family violence, for instance, domestic violence child sexual abuse, child physical abuse and overall attrition.	-55% of the (*n*=5,491) respondents reported one or more childhood family violence -34% of the (*n*=5,491) respondents attrited within four (4) years after they were enlisted -18% reported history of CSA, 36% CPA, and 32% DV - Men with all three are 303% more likely to attrite, women 139%. -15% attrite during their first year. And men more likely than women.

Appendix B

Adverse Childhood Experience (ACE) Questionnaire (Original)

Finding your ACE Score: Note a primary caregiver is "an individual such as but not limited to your biological parent(s), step-parent(s), grandparent(s), another family member, foster or adopted parent(s), aunt/uncle or other legal guardian who was responsible for your daily care and rearing."

While you were growing up, during your first 18 years of life:

1. Did a primary caregiver or other adult in the household **often** …
   Swear at you, insult you, put you down, or humiliate you? **or**
   Act in a way that made you afraid that you might be physically hurt?
   Yes No If yes enter 1 _____

2. Did a primary caregiver or other adult in the household **often** … Push, grab, slap, or throw something at you? **or**
   Ever hit you so hard that you had marks or were injured?
   Yes No If yes enter 1 _____

3. Did an adult or person at least 5 years older than you **ever**…
   Touch or fondle you or have you touch their body in a sexual way?
or
   Try to or actually have oral, anal, or vaginal sex with you?
   Yes No If yes enter 1 _____

4. Did you **often** feel that …?
   No one in your family loved you or thought you were important or special?
   or
   Your family didn't look out for each other, feel close to each other, or support each other?
   Yes No If yes enter 1 _____

5. Did you **often** feel that …?
   You didn't have enough to eat, had to wear dirty clothes, and had no one to protect you? **or**
   Your primary caregiver(s) were too drunk or high to take care of you or take you to the doctor if you needed it?
   Yes No If yes enter 1 _____

6. Were your parents or primary caregivers **ever** separated or divorced?
   Yes No If yes enter 1 _____

7. Was your mother or stepmother primary caregiver:
   Often pushed, grabbed, slapped, or had something thrown at her?
or

Sometimes or often kicked, bitten, hit with a fist, or hit with something hard?
or
Ever repeatedly hit over at least a few minutes or threatened with a gun or knife?
Yes No If yes enter 1 _____

8. Did you live with anyone who was a problem drinker or alcoholic or who used street drugs?
Yes No If yes enter 1 _____

9. Was a household member depressed or mentally ill or did a household member attempt suicide?
Yes No If yes enter 1 _____

10. Did a household member go to prison?
Yes No If yes enter 1 _____

Now add up your "Yes" answers: _____ This is your ACE Score

Appendix C

Primary Care PTSD Screen (PC-PTSD)

Description

The PC-PTSD is a 4-item screen that was designed for use in primary care and other medical settings and is currently used to screen for PTSD in veterans at the V A. The screen includes an introductory sentence to cue respondents to traumatic events. The authors suggest that in most circumstances the results of the PC -PTSD should be considered "positive" if a patient answers "yes" to any 3 items. Those screening positive should then be assessed with a structured interview for PTSD. The screen does not include a list of potentially traumatic events.

Scale

Instructions:

In your life, have you ever had any experience that was so frightening, horrible, or upsetting that, in the past month, you:

1. Have had nightmares about it or thought about it when you did not want to?

   YES / NO

2. Tried hard not to think about it or went out of your way to avoid situations that reminded you of it?

   YES / NO

3. Were constantly on guard, watchful, or easily startled?

   YES / NO

4. Felt numb or detached from others, activities, or your surroundings?

   YES / NO

Current research suggests that the results of the PC- PTSD should be considered "positive" if a patient answers "yes" to any three items.

Prins, Ouimette, & Kimerling, 2003

Appendix D

PATIENT HEALTH QUESTIONNAIRE-9 (PHQ-9)				
Over the last 2 weeks, how often have you been bothered by any of the following problems? *(Use "✔" to indicate your answer)*	**Not at all**	**Several days**	**More than half the days**	**Nearly every day**
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
. Feeling bad about yourself — or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed? Or the opposite — being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
. Thoughts that you would be better off dead or of hurting yourself in some way	0	1	2	3

FOR OFFICE CODING ____ + _____ + _____ + _____

=Total Score: _____

Appendix E

GAD-7

Over the last 2 weeks, how often have you been bothered by the following problems? *(Use "✔" to indicate your answer)*	**Not at all**	**Several days**	**More than half the days**	**Nearly every day**
1. Feeling nervous, anxious or on edge	0	1	2	3
2. Not being able to stop or control worrying	0	1	2	3
3. Worrying too much about different things	0	1	2	3
4. Trouble relaxing	0	1	2	3
5. Being so restless that it is hard to sit still	0	1	2	3
6. Becoming easily annoyed or irritable	0	1	2	3
7. Feeling afraid as if something awful might happen	0	1	2	3

(*For office coding: Total Score T____ = ____ + ____ + ____*)

Developed by Drs. Robert L. Spitzer, Janet B.W. Williams, Kurt Kroenke and colleagues, with an educational grant from Pfizer Inc. No permission required to reproduce, translate, display or distribute.

Appendix F

Dear Servicemember (SM),

You have probably completed multiple and long military surveys ***without*** any relevance to you or compensation. You will have the opportunity to win up to $75.00 in gifts cards for completing this survey. It is anticipated that the survey will take 15-18 minutes. Data will be used in future research to advocate change in policy and practice.

SMs with Mental health issues in the military has critical implications to the individual (SM), their family, and unit. By participating and completing this survey, you will make a significant contribution to make needed policy and practice changes to help our fellow brothers and sisters. The study is not controlled by the Department of Defense but is created by a fellow SM colleague affiliated with one of the branches in the military. Your participation is voluntary, and your responses are anonymous, meaning that even the research team will not know which survey answers are yours. This survey does not solicit any personally identifying information.

Some of the questions are of a personal nature. If needed a free national crisis hot line is available for all veterans at 1-800-273-TALK (8255). Your response will have added contributions to mental health research. Your participation is truly appreciated. PLEASE ask, invite, and share this survey link with others you know that are CURRENTLY in the service. Thank you!

Sincerely,

Douglas Foote

Appendix G

Informed Consent

You have been invited to participate in a research study. This form provides you with information about the study. Please read the information below to assist you better to agree or disagree with consent to be a participant. There is no third party paying for this study, and there is no cost to you. The purpose of this research study is to describe the prevalence of adverse childhood experiences and mental health within current Service Members. You are invited to participate in this research study because you are currently serving in the military in the capacity of Active Duty, National Guard, Reserves, or Inactive ready reserve (IRR) in one of the branches of the military.

The benefits of this survey will give researches a better understanding of possible origins of mental health issues and current effects. There is no direct benefit to participants. You have the opportunity to share your unique voice to fight and potentially reduce mental health issues, mental health stigma, and help your fellow brothers and sisters.

A $25.00 gift card will be given to one participant in each of the four of the military branches with the highest participation, and a $50.00 gift card will be given to one participant in the military branch with the highest participation. A separate link will be provided at the end of the survey for participants who wish to enter the drawing. Your contact information for the drawing will be stored separately from and will not be associated with your survey responses. Odds of winning are approximately 1/300 for the $25.00 gift card and 1/1200 for $50.00 card.

Your participation in this research study is voluntary. You may choose not to participate. If you decide to participate in this research survey, you may withdraw at any time. If you decide not to participate in this study or if you withdraw from participating at any time, you will not be penalized. Active duty SMs should only take your survey during Off Duty hours. DoD policy prohibits compensation for participation in most research that occurs during on-duty status. The procedure involves completing an online survey that will take approximately 15-18 minutes. Your responses will be anonymous and will not collect personal identifying information such as your name, date of birth, or SSN. Possible risks associated with this study may include experiencing emotional discomfort. The survey will ask personal questions. You may skip any question for any reason. A 24-hour, seven day a week phone number for a resource is provided should you feel the need to talk to somebody. A free national crisis hotline is available for all veterans at 1-800-273-TALK (8255).

All data is stored in a password protected electronic format on a secure server from Qualtrics for a duration of four months to allow maximum participation. After the four months, data will be protected on a local laptop with encrypted, bio-factor identification software. Additionally, any phone numbers or emails provided to enter the random drawing will be erased after the drawing. To help protect your privacy, the surveys will not collect personal identifying information to reveal who or where you are. The results of this study will be used for scholarly purposes to help mental health providers and may be shared with other researchers.
The primary investigator is an Active duty social worker and a doctoral student at the University of Kentucky College of Social Work and a faculty advisor, Dr. Chris Flaherty. Dr. Flaherty can be reached at chris.flaherty@uky.edu. If you have any questions about the research study, please contact me at dfo235@uky.edu. If you have complaints, suggestions, or questions about your rights as a research volunteer, contact the staff in the University of Kentucky Office of Research Integrity at 859-257-9428 or toll-free at 1-866-400-9428 or rs_ORI@uky.edu

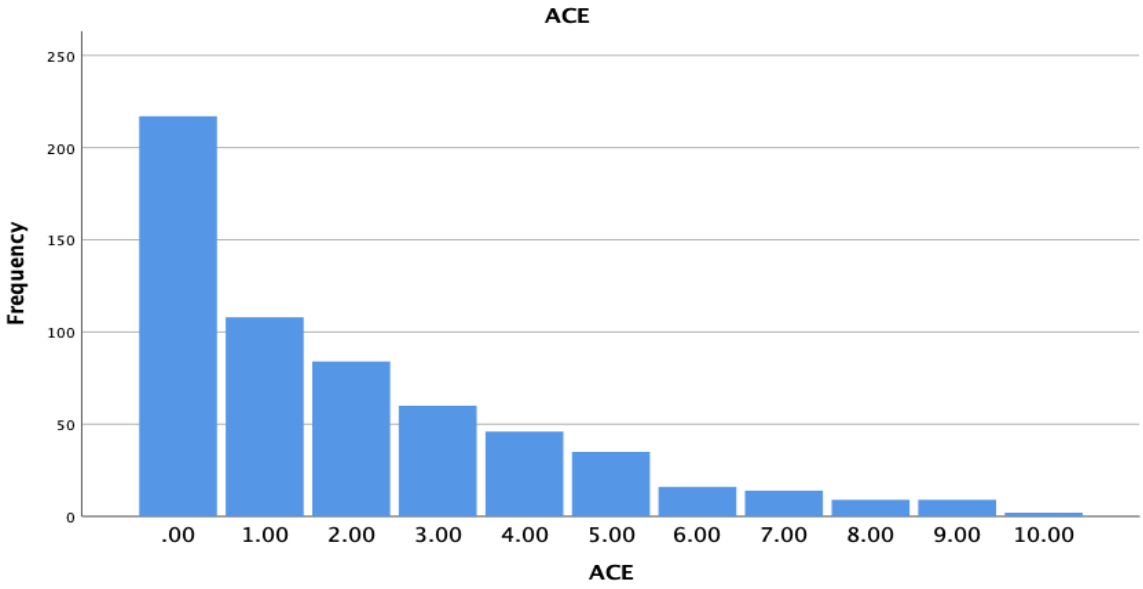
Appendix H

Descriptive Statistics

		ACE	PTSD	GAD	PHQ
N	Valid	600	600	600	600
	Missing	0	0	0	0
Mean		1.9700	.9100	5.3100	5.3517
Median		1.0000	.0000	4.0000	3.0000
Mode		.00	.00	.00	.00
Minimum		.00	.00	.00	.00
Maximum		10.00	5.00	21.00	25.00

ACE Frequency Table and Bar Chart

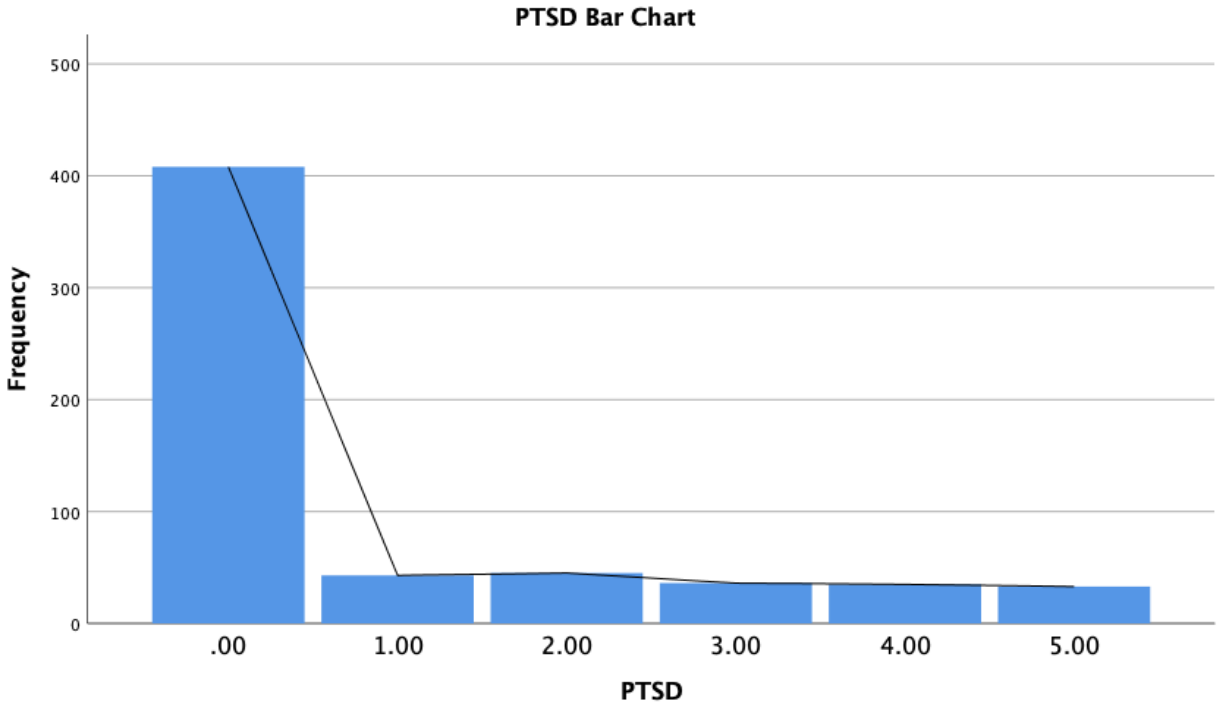
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	217	36.2	36.2	36.2
	1.00	108	18.0	18.0	54.2
	2.00	84	14.0	14.0	68.2
	3.00	60	10.0	10.0	78.2
	4.00	46	7.7	7.7	85.8
	5.00	35	5.8	5.8	91.7
	6.00	16	2.7	2.7	94.3
	7.00	14	2.3	2.3	96.7
	8.00	9	1.5	1.5	98.2
	9.00	9	1.5	1.5	99.7
	10.00	2	.3	.3	100.0
	Total	600	100.0	100.0	



Appendix I

PC-PTSD 5 Frequency Table and Bar Chart

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	408	68.0	68.0	68.0
	1.00	43	7.2	7.2	75.2
	2.00	45	7.5	7.5	82.7
	3.00	36	6.0	6.0	88.7
	4.00	35	5.8	5.8	94.5
	5.00	33	5.5	5.5	100.0
	Total	600	100.0	100.0	

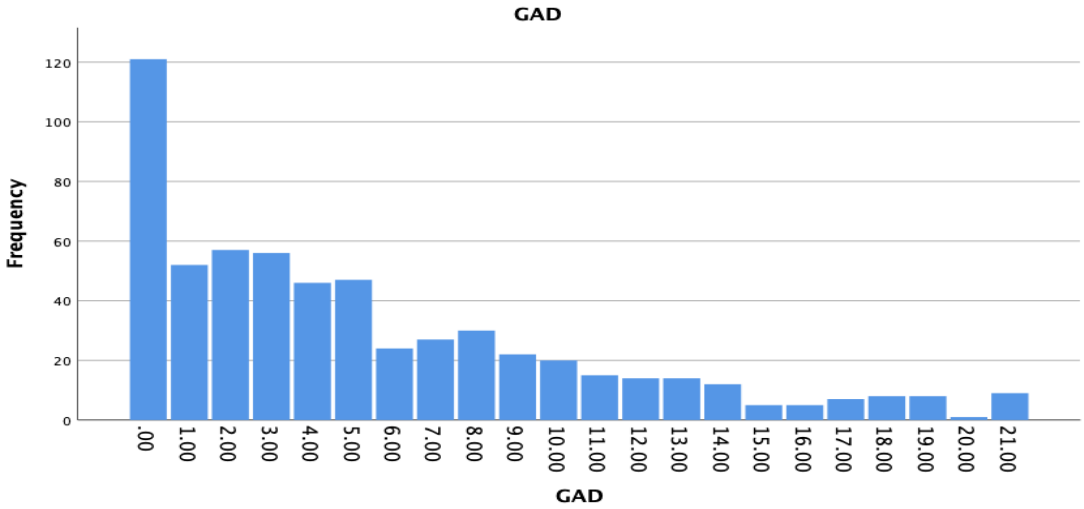


Appendix J

GAD-7 Frequency Table and Bar Chart

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	121	20.2	20.2	20.2
	1.00	52	8.7	8.7	28.8
	2.00	57	9.5	9.5	38.3
	3.00	56	9.3	9.3	47.7
	4.00	46	7.7	7.7	55.3
	5.00	47	7.8	7.8	63.2
	6.00	24	4.0	4.0	67.2
	7.00	27	4.5	4.5	71.7
	8.00	30	5.0	5.0	76.7
	9.00	22	3.7	3.7	80.3
	10.00	20	3.3	3.3	83.7
	11.00	15	2.5	2.5	86.2
	12.00	14	2.3	2.3	88.5
	13.00	14	2.3	2.3	90.8
	14.00	12	2.0	2.0	92.8
	15.00	5	.8	.8	93.7
	16.00	5	.8	.8	94.5
	17.00	7	1.2	1.2	95.7
	18.00	8	1.3	1.3	97.0
	19.00	8	1.3	1.3	98.3
	20.00	1	.2	.2	98.5
	21.00	9	1.5	1.5	100.0
	Total	600	100.0	100.0	

Appendix K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80
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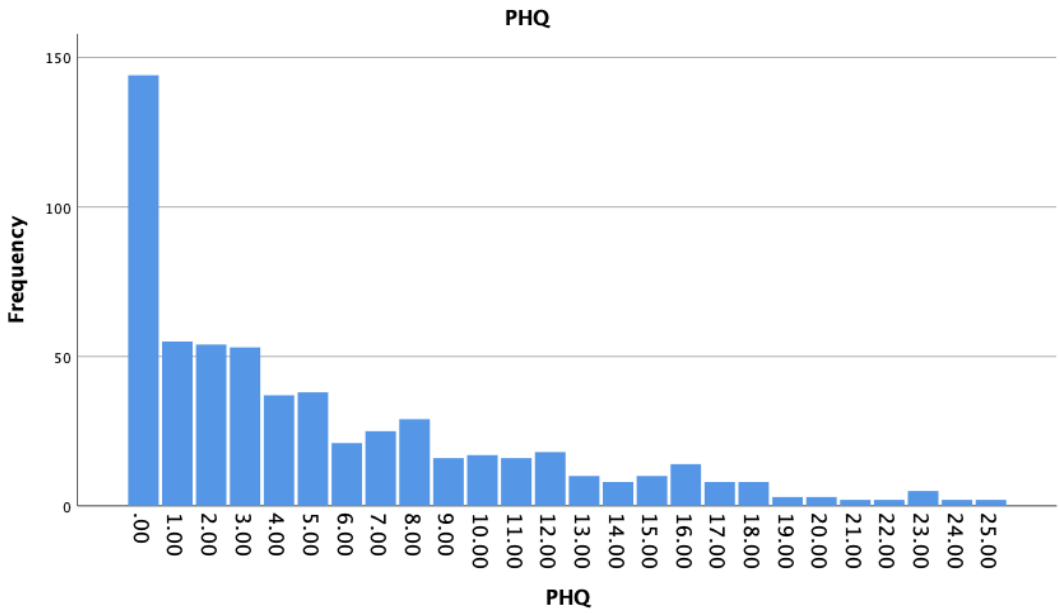
GAD

PHQ-9 Frequency Table and Bar Chart

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	144	24.0	24.0	24.0
	1.00	55	9.2	9.2	33.2
	2.00	54	9.0	9.0	42.2
	3.00	53	8.8	8.8	51.0
	4.00	37	6.2	6.2	57.2
	5.00	38	6.3	6.3	63.5
	6.00	21	3.5	3.5	67.0
	7.00	25	4.2	4.2	71.2
	8.00	29	4.8	4.8	76.0
	9.00	16	2.7	2.7	78.7
	10.00	17	2.8	2.8	81.5
	11.00	16	2.7	2.7	84.2
	12.00	18	3.0	3.0	87.2
	13.00	10	1.7	1.7	88.8
	14.00	8	1.3	1.3	90.2
	15.00	10	1.7	1.7	91.8
	16.00	14	2.3	2.3	94.2
	17.00	8	1.3	1.3	95.5
	18.00	8	1.3	1.3	96.8
	19.00	3	.5	.5	97.3
	20.00	3	.5	.5	97.8
	21.00	2	.3	.3	98.2
	22.00	2	.3	.3	98.5
	23.00	5	.8	.8	99.3
	24.00	2	.3	.3	99.7
	25.00	2	.3	.3	100.0
	Total	600	100.0	100.0	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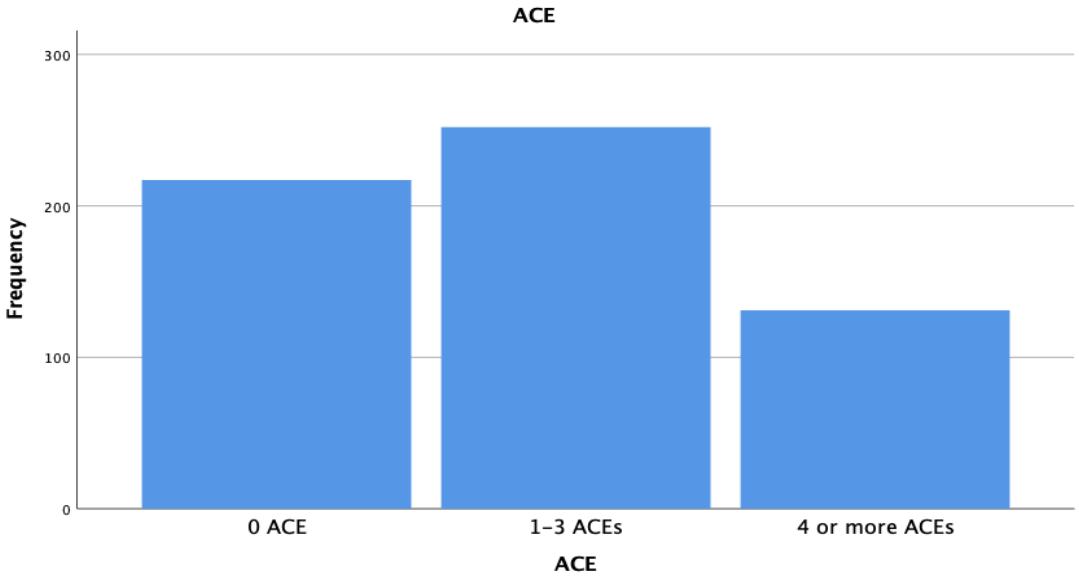
PHQ

Appendix L

Grouped ACE Frequency Table and Bar Chart

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	0 ACE	217	36.2	36.2	36.2
	1-3 ACEs	252	42.0	42.0	78.2
	4 or more ACEs	131	21.8	21.8	100.0
	Total	600	100.0	100.0	



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