Cognitive-Behavioral Interventions to Reduce Suicide Attempt and Completion among Female Service Members and Veterans: A Systematic Review

by

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Abstract

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This thesis is a semi-replication study that looks at the current knowledge base regarding the efficacy of cognitive behavioral therapy (CBT) as an intervention to reduce suicide attempt or suicide completion vs. TAU, with the female active-duty and veteran populations. Since 2008, when the original study was conducted, there has been a scarce amount of intervention studies conducted to test CBT interventions within this population. This research used a systematic review methodology to conduct analysis of the 2 studies that were found to meet inclusion criteria. The overall synthesis of both studies found that the combined results of the included studies show some evidence that CBT intervention is more effective at reducing suicidal behavior in a female active duty population than TAU. However, due to severe limit of clinical trials available, poor study quality and individual study limitations on directness towards the intended population, effectiveness cannot be definitively concluded. The data results prompt for future research to extend beyond only assessing risk factors for suicide, to evaluating CBT as an intervention on suicidal behavior, specifically for female active-duty and veterans.

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Chapter 1

Introduction

Nature of the Problem

For over 10 years, suicide has remained one of the top 10 leading causes of death for Americans (American Foundation for Suicide Prevention, 2015a). According to the American Foundation for Suicide Prevention, there is an American suicide every 12.95 minutes and veterans make up 22.2% of those deaths (American Foundation for Suicide Prevention, 2015b). The Department of Defense (DoD) has made suicide prevention a priority, due to the staggering yearly statistics of more veteran and active duty military personnel taking their own lives. In 2009, the Department of Defense Task Force on the Prevention of Suicide by Members of the Armed Forces was formed, consisting of DoD and external formal experts in various fields to "detail research and formulate recommendations in the prevention of further suicide within the military" (The Department of Defense Task Force on the Prevention of Suicide by Members of the Armed Forces, 2010). In 2012, the DoD reported that servicemember suicide rates across military branches were higher than rates of death during combat in the Iraq and Afghanistan wars (Rudd, 2012). Subsequently, President Obama has signed the Clay Hunt Suicide Prevent Act this past February, as a supportive measure for veteran mental health care. Despite political, research and program initiatives, veteran suicides are still high, and for some subgroups, such as women and young male veterans, rates are rising (York, Lamis, Pope, & Egede, 2012)

Villatte et al., (2015) argue that "between 2001 and 2010 male veteran suicides increased by 15% while suicides among female veterans increased by 35%" (p. 3). These recent findings indicate that servicewomen and women veterans, although a relatively smaller percentage across branches, are committing suicide at twice the rate of

men in the military (Villatte et al., 2015). Seen by some researchers as a “hidden epidemic”, female veteran suicide rates have been increasing, with committed suicides 6 times the rate of civilian women (York, Lamis, Pope & Egede, 2012). As studies have found both the female gender and young age are high risk factors for rising veteran suicide (young male veterans between ages 18-25 are the other high risk group), female veterans are posed with a unique challenge due to the intersection of their gender and age, which causes them double the risk of committing suicide (York, Lamis, Pope & Egede, 2012). There are more servicewomen who serve in the military now, than in any other time in history. Due to recent wars such as Iraq and Afghanistan, more women have been put into combat related environments that have also increased their risk for psychological and physical distress. Women in the military are also exposed to unique challenges that put them at high risk for suicide attempts, due to their gender and minority status in a male driven culture (Gutierrez et al., 2013). More women who call suicide hotlines due to PTSD, are also distressed by sexual abuse and harassment experienced in the military (Spiegel, 2010). Although male veteran suicide rates are higher in relation to their percentage majority in all military branches, women are still 3 times likely to attempt suicide than males (Suicide: 2015 Facts and Figures, 2015). Also, a recent study of the increased suicide rates for female veterans show that per 100,000 women in the military, 28.7 percent committed suicide compared to 5.2 percent of women in the general population (Hoffmire, Kemp & Bossarte, 2015; Zarembo, 2015). Further, for users of the VHA, females are likely to commit suicide twice as much as the general population (Gutierrez et al., 2013).

Relevance to the Social Work Profession

The proposed study is relevant to social work because professionals in the field hold a strong force in many environments that treat Veterans, such as the VHA and other

community health clinic settings. Frey et al. (2014) highlights the finding that “up to 70% of the total military community seeking mental health services will receive treatment from civilian mental health providers (as cited in Hassan et al., 2010, p. 713). Also, Frey et al. (2014) notes that within these community health centers, the greatest number of practitioners to work with this population are social workers (as cited in Simmons & DeCoster, 2007). As such, social workers need empirically based research that provides insight and frameworks for the interventions that will be effective in treating the unique needs of female servicemembers and veterans, and military personnel overall.

Chapter 2

Review of the Literature

As more research for suicide prevention is being conducted, several studies have shown that psychotherapies such as Cognitive Behavioral Therapy (CBT) and Brief Cognitive Behavioral Therapy (BCBT) have a positive effect on the reduction of suicidal behavior. In Veteran Affairs (VA) clinics around the U.S. these therapies have been recommended as the first-line of treatment for veterans who are at risk of suicide due to depression (Deploymentpsych.org, 2015); however, according to a recent systematic review on the effects of CBT for depression in veterans, results were mixed concluding that one: studies showed that CBT was not an effective treatment for Veterans (in contrast to research showing its effectiveness on civilians), and two: "high quality research" focused on CBT and military personnel is too limited to effectively understand the implications of the intervention on this population (Hundt, Barrera, Robinson & Cully, 2014).

Other studies not included in the 2014 review, however, offer different results, such as finding that BCBT and other tailored forms of psychotherapy specific to veterans produce positive results of reduction of suicidal behavior (Rudd, 2012). Two primary components of BCBT, treatment compliance and skill mastery, seem especially beneficial for those in a unique and vastly shifting environment such as the military (Rudd, 2012). As CBT is widely regarded as an effective treatment for many of the risk factors associated with suicidal behavior in veterans (e.g., depression, PTSD, hopelessness, lack of impulse control, and other readjustment stressors), it is plausible that when it comes to treatment of the specific issues female veterans are dealing with, CBT interventions should be helpful in reduction of their suicide behavior.

A 2008 systematic review and meta-analysis on cognitive behavioral interventions to reduce suicide behavior served as groundwork to establish a need for an updated study, to be undertaken in this thesis project. The 2008 review analyzed studies that treated people with a variety of mental disorders, including depression, personality disturbance, bipolar disorder, drug dependency, and others (Tarrier, Taylor & Gooding, 2008). Primarily, interventions were focused on overall suicidal behavior, which extended to suicidal ideation, plans and behaviors, which this proposed thesis will exclude (Tarrier, Taylor & Gooding, 2008). The population studied was general in regards to age, gender, ethnicity, and nationality. Inclusion criteria were set for any treatment that "consisted of a form of cognitive, behavioral, or CBT or a substantial component of cognitive-behavioral, cognitive, or behavioral methods in treatment; a control group as a comparison (such as treatment as usual [TAU], no treatment, wait list, or another form of treatment); and any kind of self-harm or suicide behavior as an outcome measure" (Tarrier, Taylor & Gooding, 2008, p. 80).

The first hypothesis tested in this review was that "CBT would significantly reduce suicide thoughts and behaviors in the experimental groups as compared to the control groups" (Tarrier, Taylor & Gooding, 2008, p. 79). The second hypothesis tested was that "CBT would have an immediate effect…within 3 months of treatment and a more long term effect…between 6 and 24 months after treatment" (Tarrier, Taylor & Gooding, 2008, p. 80). Overall findings for this review were that in the short term, CBT was effective in diminishing suicidal behavior "across the spectrum", (Tarrier, Taylor & Gooding, 2008, p.100). Also, CBT was more effective with treatment in adults than adolescents, when compared to minimal treatment or TAU, and when focused on reducing suicidal behavior as a primary vs. secondary effect (Tarrier, Taylor & Gooding, 2008).

Other literatures reviewed were focused around CBT on active duty and veterans in general, and were not specific in gender or regarding suicidal behavior specific to the military. Therefore, this proposed systematic review will partially replicate the 2008 review, but with narrower inclusion criteria to focus on studies that test cognitive-behavioral interventions on the populations of Female Active-Duty servicemember and Veterans. The research question for this proposed review is: Are there fewer suicide attempts or completions among female active-duty servicemember and veterans with mental diagnoses/symptoms who receive cognitive-behavioral therapies (CBTs) than among those who receive no treatment or other treatment (TAU)?

Chapter 3

Methodology

A systematic review of all studies from 2008 to present day was conducted, regarding the effectiveness of CBT interventions on suicidal behavior-namely suicidal attempt and suicidal completion-- on the female active duty and veteran population. This systematic review is a replication of the general population systematic review and meta-analysis conducted in 2008, but provides a synthesis of the knowledge regarding female active duty and veterans specifically. Because of the increase of women in the military since 2001, the review done in 2008 needed to be updated to gather the information to see what the status is for active duty and veterans. In this study, PICO was used to structure keywords to filter through multiple databases. PICO is a protocol most widely used in Evidence Based Medicine to help researchers construct focused questions to help guide their literature search (Biggam, 2015). The acronym stands for Population, Intervention, Comparison (or control) intervention, and Outcome (Biggam, 2015).

PICO Questions:

1. For Female Veterans at risk of suicide, does CBT interventions reduce suicide attempt?
2. For Female Active Service Members at risk of suicide, does CBT interventions reduce suicide attempt?
3. For Female Veterans at risk of suicide, does CBT interventions reduce suicide completion?
4. For Female Active Service Members at risk of suicide, does CBT interventions reduce suicide completion?

Literature Search and Retrieval Process

A general search was conducted through databases and academic journals accessed electronically through the University of Texas at Arlington's library system. The databases that were searched were: Academic Search Complete (August 2015); CINAHL Complete (August 2015); MEDLINE (EBSCO) (August 2015); ProQuest Dissertation and Theses (PQDT Global) (August 2015); Psych Info (August 2015); Social Work Abstracts (August 2015); Science Direct (September 2015); PubMed (September 2015); and Cochran Library (October 2015). The academic journals that were electronically searched were: Archives of Suicide Research (September 2015); Cognitive and Behavioral Practice (September 2015); Suicide and Life-threatening Behavior (September 2015); Military Medicine (September 2015); Journal of Crisis Intervention and Suicide (September 2015); Journal of Mental Health Counseling (September 2015); The American Journal of Psychiatry (September 2015); Military and Behavioral Health (September 2015); and Military and Government Collection (September 2015).

Additional records were identified through the search engine Google Scholar (October 2015); grey literature was searched through the online database www.grelit.org (October 2015); and government database maintained by the U.S. Department of Veteran Affairs (September 2015). All relevant articles' bibliographies were also scanned for eligible sources and a final reverse citation searched was conducted through the Web of Science database (October 2015). Please see *Appendix C* for the search terms used in this search strategy.

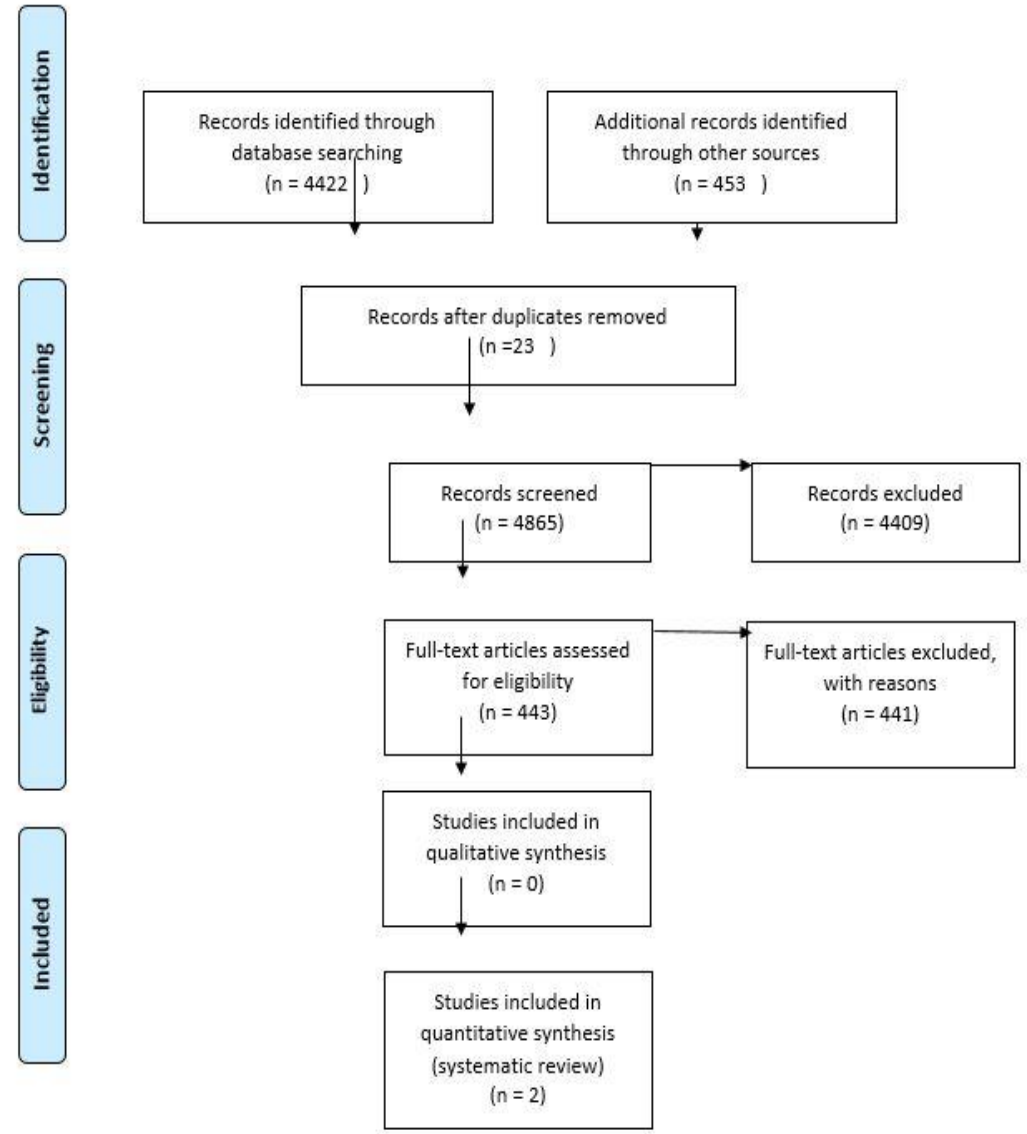

Figure 3-1 Flowchart of the Literature Retrieval Process
(The PRISMA Group, 2009)

Selection Criteria

As this systematic review is a partial-replication study of the 2008 systematic review (Tarrier, Taylor & Gooding, 2008).), the inclusion and exclusion criteria were restricted in an effort to generate new source material to provide an accurate update of the general knowledge base. The inclusion criteria all articles were subjected to were that they had to be published in the English language, were randomly controlled trials, and were scholarly peer-reviewed (grey literature and theses were an exception). Also, the population studied had to include women, in particular women in the military both active duty and veteran, the age of the participants had to be 18 years or older, the intervention had to be specifically Cognitive Behavioral Therapy, the outcomes measured were restricted to only suicidal behaviors of attempt and/or completion and finally all articles had to be published on or after 2008. Due to the sparse researched presently conducted on this chosen research topic, extensions to the eligibility criteria were made to include studies that had a mixed sample of both men and women, as well as studies who's samples included ages below and above 18 years.

Selection Guidelines Used

The literature gathered from the search phase was reported using set evidence based guidelines established by the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) (Liberati et. al, 2009). These guidelines comprise a 27 item checklist *(see Appendix A)* that will help ensure the transparency in the reporting of entries within: the title, abstraction, introduction, methods, results, and discussion portions of this systematic review (Liberati et. al, 2009). PRISMA further guides the systematic filtering process of identified studies using a four-phase flow diagram that was utilized *(see Figure 3-1)* (Liberati et. al, 2009). To rate the quality of evidence found in

the studies that will be searched, the author used the Grading of Recommendation Assessment, Development and Evaluation (GRADE) protocol *(see Appendix B)* (GRADE Working Group, 2004). This protocol aided in judging the criteria and information gathered in the analysis and summarization stage of this review based on: the quality of evidence presented, the judgments made based on the overall outcomes, the importance of the outcomes stated, the balance between the benefits, harms, and cost, and the extent of use of the findings (GRADE WORKING GROUP, 2004). Using this protocol, the author examined the extracted data for patterns that showed evidence across studies on length of effects (short or long term), the type of CBT intervention implemented and the effectiveness associated, the types of responses from the different types of women such as veteran versus active duty, and the overall heterogeneity in variables across studies *(see Table 3-1).* The synthesized results are displayed in a custom table that were included in this systematic review *(see Table 4-1).*

Chapter 4

Results

Figure 3-1 shows the search results, following the strategy described in the Methods section to retrieve and determine eligibility of articles used in this systematic review.

Data Collection and Analysis

To determine if all studies met eligibility criteria and were relevant for this systematic review, key data were extracted. Each piece of information related to the PICO's, author and title identification, study design, setting, author hypothesis, measured outcomes and results are presented in Table 4-1.

Risk of Bias Assessment

Each study was selected and examined by one person, with some consultation with the faculty chair member; however, the final selection was done individually. The extracted data was rigorously assessed for overall quality of evidence using the GRADE protocol. Determinations of the risk of bias and general conclusion of effectiveness of the selected studies will be further examined in the synthesis section of this thesis (*see Table 3-1*).

4,422 articles were identified through the electronic database and journal search. Another 453 articles were sourced through search engines, a government document search and a reversed citation search, which brought the total articles identified to 4,875. Due to overlapping of material in each database, 23 duplicates were identified and removed. The remaining 4,865 articles were then briefly screened by title and abstract, which led to the exclusion of 4,409 records. These records were excluded for many reasons such as: not meeting relevant PICO criteria, not being written in English, and ineligible study design. This left 443 articles to be pulled for full-text review to determine

if they met full inclusion criteria, 8 of which were requested through the university interlibrary loan program.

After a full review of all articles, it was determined that out of 443, only 2 matched the inclusion criteria to be considered for this systematic review. One of the articles was sourced from the American Journal of Psychiatry, via the CINAHL Complete electronic database; the other was sourced from the British Journal of Psychiatry, via the search engine, Google Scholar. The other 441 articles were excluded due to: lack of women included in the sample population, and lack of eligible intervention, and/or lack of any suicidal behavior (attempt or completion) measured in the primary outcome. After all search strategies were completed, there were only two studies found that met inclusion criteria for this systematic review. Notable similarities and differences regarding the different components of each study will follow.

Population

Rudd et al. (2015) performed an American based study, whose sample population consisted of 152 active duty army soldiers who either had present suicidal ideations with intent to die or made a suicide attempt within the past month they were enrolled in the study. This sample was comprised of mostly males, with a mean age of 27. Females studied in this sample were estimated to be around 20-25%. Slee et al. (2008) performed a study in The Netherlands, and studied a sample population of 90 adolescents and young adults who had recently engaged in an episode of self-harm (deliberate and with or without intent to die). This sample comprised a majority of females at 91%, however the exact percentage of females 18 years or older could not be determined from the data presented. Both studies were conducted in an outpatient setting and both samples had high levels of psychiatric comorbidity present. It is notable that Slee et al. (2008) did exclude participants that had a severe psychiatric comorbidity,

such as schizophrenia, and Rudd et al. (2015) did not. Also, Rudd et al. (2015) used a computer randomization program in their design, however there was not a clear explanation of the randomization process in the design used by Slee et al. (2008).

Treatment Conditions

Both studies used an intervention in addition to treatment as usual (TAU) vs. treatment as usual alone group to test the effectiveness that brief (BCBT) or short (CBT) cognitive behavioral therapy would have on the reduction of suicide attempts (Rudd et al. 2015) or episodes of self-harm (Slee et al., 2008). The sample size for the BCBT+TAU group for Rudd et al. (2015) was n=76 (15.8% female) and TAU was n=76 (9.2% female). The Slee et al. (2008) study had a short CBT+TAU group of n=48 (97% female) and TAU of n=42 (91%) female. Both studies CBT interventions comprised of 12 sessions, however Slee et al. (2008) only used 10 sessions for actual CBT intervention and the remaining 2 for follow-up. Rudd et al. (2015) CBT intervention split sessions into 3 phases, unlike Slee et al. (2008), however both interventions focused on the development of skills, such as emotion regulation and problem-solving ability.

Both study CBT interventions and TAU groups suffered several dropouts before and during the study period. Rudd et al. (2015) had an intervention group dropout rate of 11% with 1 person to drop out before the first session. Slee et al. (2008) had an intervention group dropout rate of 17%, however all dropouts in this group were before treatment started. This meant that for Slee et al. (2008) 100% of their participants completed all CBT sessions, unlike Rudd et al. However, the early dropout rate led to a reduced CBT group n=40 being included in the authors final analysis (Slee et al., 2008). In both studies, the dropout rates were higher in the TAU arm. Rudd et al. (2015) had a dropout rate of 13.2%, while Slee et al. (2008) had a dropout rate of 21%. Both studies also suffered from deaths by suicide during treatment, with Rudd et al. (2015) having one

competed suicide each in CBT and TAU arms, while Slee et al. (2008) had only one death by suicide in the TAU arm. TAU was defined similarly for both studies as: individual or group psychotherapy; psychiatric medication; or substance abuse treatment. However, Slee et al. (2008) failed to record the specific types or amounts received by participants. Finally, both studies had a follow-up period to record the effect of the CBT intervention after treatment was done, but with stark contrast as Rudd et al. (2015) conducted a 24 month follow up, while Slee et al. (2008) only conducted follow up to 9 months.

Measures Used

The assessments used throughout each study to measure the primary and secondary outcomes were similar. In Rudd et al. (2015), the authors used a Suicide Attempt Self-Injury Interview Score (SASIS) to rate the occurrence of suicide attempts, while Slee et al. (2008) used a Structured Clinical Interview (SCI) to measure the number of episode of self-harm in each 3 month period. Unlike the assessment used in Rudd et al. (2015), the SCI is not a validated measurement tool. The secondary outcomes measured were the same in both studies, with slight variation in assessment tools. All secondary outcomes were self-reported by patients in both studies (see Table 4-1), but due to the mobile nature of the Rudd et al. (2015) military sample, only self-reports up to 18 month follow up were included in their analysis. Also, the authors did not mask assessments to the control groups in the Slee et al. (2008) study, but the authors in the Rudd et al. (2015) study did.

Method of Analysis

Both studies conducted power and intent-to-treat analysis to detect the group differences on treatment effectiveness to reduce suicidal behavior outcomes. There were also similar multiple analysis performed in each study to account for any random missing

data, the effect drop outs may have had on primary outcomes and baseline characteristic effect on primary outcomes. For Rudd et al. (2015) and Slee et al. (2008) studies, there was no significance of effect found between groups in terms of demographic characteristics, psychiatric comorbidity, or study dropout rates in both arms of treatment. Although, there was a significant difference noted in the Rudd et al. (2015) study regarding the CBT treatment arm difference in magnitude in treatment effect on repeat suicide attempts vs. TAU over the course of the study.

Findings

Results for each primary and secondary outcomes in both studies were supported. The authors in Rudd et al. (2015) found that the BCBT+TAU treatment had a suicide attempt rate of 13.8% compared to TAU which had a suicide attempt rate of 40.2%; this culminated to a significant 60% difference in reduction of suicide attempts for the BCBT+TAU group. Similarly, the authors of Slee et al. (2008) found a significant reduction in reducing the number of episodes of self-harm over time as well. For secondary outcomes, there were some reported differences of effectiveness of the CBT treatment across studies, please refer to the data in Table 4-1.

Table 4-1 Summary of Included Studies

Study design	Sample	Hypothesis	Intervention/Comparison	Measures	Outcomes
Slee et al., (2008) Type: RCT Setting: Outpatient/ Community mental health center	*N* = 90 adolescents and adults, majority Female, Dutch nationality, Race NR, ages 15-35 years old, recently engaged in self-harm (both deliberate self-poisoning and self-injury). High levels of psychiatric comorbidity present.	H1: Rate of self-harm lower with short CBT+TAU vs. TAU alone. H2: CBT+TAU condition predicts lower scores for depression, anxiety, suicidal cognitions vs. TAU alone. H3: CBT+TAU condition predicts higher scores for self-esteem and problem-solving ability than TAU alone.	Short CBT+TAU: *N* = 48, 97% female. Individual therapies once weekly for ten weeks + 2 follow up sessions. TAU: *N* = 42, 91% female. Patients chose any form they wanted, but 3 forms recorded: Psychotropic medication, Psychotherapy and Psychiatric hospitalization. Didn't record specific types of each patients received.	Primary: Structural Clinical Interview. Secondary: Beck Depression Inventory-II; Symptom checklist-90; Robson Self-Concept Questionnaire (short version); Suicide Cognition Scale; Coping Inventory for stressful situations (CISS).	H1-H3: Study results supported all hypotheses.

Table 4.1- *Continued*

Rudd et al., (2015) Type: RCT Setting: VA Outpatient; Community mental health center	*N* = 152 active-duty Army soldiers, majority Male, mean age 27, mixed ethnicities, presence of suicidal ideation with intent to die during the past week and/or suicide attempt within the past month. High levels of psychiatric comorbidity present.	H1: hazard ratio for a subsequent suicide attempt would be lower in BCBT+TAU vs. TAU alone. H2: proportion of soldiers making a suicide attempt during follow-up would be lower in BCBT+TAU vs. TAU alone.	BCBT+TAU: *N* = 76, 15.8% female Individual therapy weekly or biweekly (first session 90 minutes and subsequent sessions 60 minutes). TAU: *N* = 76, 9.2% female. Individual and group psychotherapy; psychiatric medication, substance abuse treatment and/or support groups, as determined by licensed military psychologist and psychiatrists.	Primary: Suicide Attempt Self-Injury Interview. Secondary: Beck Scale for Suicide Ideation; Beck Depression Inventory-II; Beck Anxiety Inventory; Beck Hopelessness Scale; PTSD Checklist – Military version.	H1: Study results supported hypothesis. H2: BCBT+TAU 60% less likely to make a suicide attempt during follow-up vs. TAU alone. No significant between-group differences across secondary outcome measures.

Note: H1 = Hypothesis 1; H2 = Hypothesis 2; H3 = Hypothesis 3.

It is interesting to note that Slee et al. (2008) actually found that CBT+TAU had a stronger effect on secondary measures than self-harm itself. The authors concluded that this showed a reversal in effect of treatment of CBT+TAU on secondary outcomes first and self-harm second. Also, it is noted that both studies found that outpatient vs. inpatient treatment of CBT+TAU was more effective and more cost efficient, as well as the need for suicidal behavior to be treated separately from psychiatric symptoms (Rudd et al., 2015; Slee et al., 2008). This was supported by the positive effect in the CBT+TAU treatment arm through the participants' development of emotion regulation skills and problem solving skills, which the TAU participants were not exposed to. Slee et al (2008) proposed that the change mechanisms to further account for this effect was either the

targeted CBT focus on reducing suicidal cognitions, measured using the Suicide Cognition Scale, or the increase in participants problem-solving capabilities, which was measured using the Coping Inventory for Stressful Situation (CISS) (Slee et al., 2008).

Quality of Evidence

Study quality was assessed with the application of the GRADE criteria on each study over outcomes and the results are presented in Table 3-1. The results show that the Rudd et al. (2015) study met the criteria for a moderate quality GRADE, whereas the Slee et al. (2008) study met the criteria for a very low quality GRADE. The demarcations in quality resulted from the type and severity of limitations that suggest a risk of bias in the study, with most serious limitations observed in the Slee et al. (2008) study.

Table 3-1 Results of Articles Reviewed GRADE Criteria

Outcomes	Design	Quality	Consistency	Directness	Imprecise data	Reporting bias	GRADE
(Slee et al., 2008)							
Primary outcome (measured with Structure Clinical Interview from baseline to 9 months)							
Reduction of the number of self-harm episodes	RCT	(-2) very serious limitations	(-1) Important inconsistency	(-1) some uncertainty about directness	No serious imprecision	Unlikely	Very Low
Secondary outcomes (measured with patient self-report)							
Depression (measured with Beck Depression Inventory-II) (Slee et al., 2008)	RCT	(-2) very serious limitations	(-1) Important inconsistency	(-1) some uncertainty about directness	No serious imprecision	Unlikely	Very Low
Anxiety (measured with Symptom checklist-90)	RCT	(-2) very serious limitations	(-1) Important inconsistency	(-1) some uncertainty about directness	No serious imprecision	Unlikely	Very Low
Self-esteem (measured with Robson Self-Concept Questionnaire (short version)	RCT	(-2) very serious limitations	(-1) Important inconsistency	(-1) some uncertainty about directness	No serious imprecision	Unlikely	Very Low
Suicidal cognition (measured with Suicide Cognition Scale)	RCT	(-2) very serious limitations	(-1) Important inconsistency	(-1) some uncertainty about directness	No serious imprecision	Unlikely	Very Low
Problem solving ability (measured with Coping Inventory for stressful situations-CISS	RCT	(-2) very serious limitations	(-1) Important inconsistency	(-1) some uncertainty about directness	No serious imprecision	Unlikely	Very Low

Table 3.1 –*Continued*

(Rudd et al., 2015)							
Primary outcome (measured with Suicide Attempt Self-Injury Interview from baseline to 24 months)							
Occurrence of suicide attempts	RCT	(-1) serious limitations	No serious inconsistency	(-1) some uncertainty about directness	No serious imprecision	Unlikely	Moderate
Secondary outcomes (measured with patient self-report)							
Suicide ideation (measured with Beck Scale for Suicide Ideation)	RCT	(-1) serious limitations	No serious inconsistency	(-1) some uncertainty about directness	No serious imprecision	Unlikely	Moderate
Depression severity (measured with Beck Depression Inventory-II)	RCT	(-1) serious limitations	No serious inconsistency	(-1) some uncertainty about directness	No serious imprecision	Unlikely	Moderate
Anxiety severity (measured with Beck Anxiety Inventory)	RCT	(-1) serious limitations	No serious inconsistency	(-1) some uncertainty about directness	No serious imprecision	Unlikely	Moderate
Hopelessness severity (Beck Hopelessness Scale)	RCT	(-1) serious limitations	No serious inconsistency	(-1) some uncertainty about directness	No serious imprecision	Unlikely	Moderate
PTSD severity (measured with PTSD Checklist – Military version)	RCT	(-1) serious limitations	No serious inconsistency	(-1) some uncertainty about directness	No serious imprecision	Unlikely	Moderate

Note: See Appendix B for GRADE Criteria Explanation

Chapter 5

Discussion

The research question posed for this systematic review was: Are there fewer suicide attempts or completions among female active-duty service members and veterans with mental diagnoses/symptoms who receive cognitive-behavioral therapies (CBTs) than among those who receive no treatment or other treatment (TAU)? Results from the two retrievable studies that met inclusion criteria suggest that there is a positive CBT effect on suicidal behavior over TAU alone.

Although there is simply not enough evidence in both studies to arrive at a definitive conclusion, there is enough evidence that the question is positively supported. Rudd et al. (2015) found that with a BCBT+TAU treatment, active duty soldiers experience 60% less suicide attempts during follow up than did the soldiers in the TAU alone treatment (largest reduction of suicidal behavior found in any study). The results from this study show that BCBT+TAU had a significant effect on reducing suicidal behavior when applied to military populations. The findings from the Slee et al. (2008) study revealed that short CBT+TAU had a significant effect on reducing the number of repeating an episode of self-harm vs. TAU alone (is among first studies to study brief CBT towards self-harm). This finding supports that a CBT intervention treatment may have a positive effect when applied to a majority population sample of women.

Nonetheless, with one study showing a significant effect on a majority military population and the other showing a significant effect on a majority female general population, the combined results at best offer a mixed finding towards CBT likely having a beneficial effect on reducing suicidal behavior with a female active duty and veteran population. This outcome is more heavily impacted by the study conducted by Slee et al. (2008), which didn't show as much impact on actual suicidal behavior. This was probably

resulting from the sample being diluted, per inclusion criteria, because it included self-harm.

In regards to psychiatric comorbidity symptoms, both studies indicated that a CBT intervention had significant effects on decreasing negative emotions such as: depression, anxiety and social cognitions, while increasing mechanism associated with positive change such as: emotion regulation, hopelessness and problem solving skills (Rudd et al., 2015; Slee et al., 2008). However, the authors in Slee et al. (2008) found that there was no significant difference between treatment arms across these measures. Despite this, one of the underlying principles of CBT is that behavioral skill deficits are related to suicidal cognitions, and a risk factor, any increase in behavioral skills is relevant towards reducing overall suicidal behavior. Also, both studies' attention on reducing repeated suicidal behavior highlighted that a previous attempt is the strongest risk factor for future attempts or completions.

Study Limitations

The state of overall quality of evidence presented in this systematic review ranged from very low to moderate, thus reliability of effect can be questioned. Rudd et al. (2015) received a moderate quality rating after applying GRADE criteria after having limitations that imply some risk of bias in the study. Although this study received a high mark for having a randomized control design, it was marked down in terms of quality for using an invalidated outcome measure, self-reporting, on the secondary outcomes. The results of the author's decision proved to cause incomplete findings regarding accurate information specific to psychiatric severity, because they were only able to analyze self-reports on these measures up to 18 instead of 24 months. According to Tarrier et al. (2008), mental illnesses are a risk factor for suicidal behavior, thus not having an accurate measure of the effect an intervention has in populations that suffer from such

illness weakens the ability to draw conclusions towards its effectiveness. A limitation with directness in the Rudd et al. (2015) study showed weak external validity concerning the ability to generalize the efficacy of BCBT treatment due to the sample studied. Although active duty military soldiers made up the sample, only a small percentage of women (about 20%) were treated (Rudd et al., 2015). Since the interest of this systematic review was to see the effect on women, having an almost all male sample greatly hindered the ability generalize treatment results to this subgroup of the military population. Also, there were no veterans or other service members from other military branches present in this study, further limiting confidence in the application effectiveness towards the interested population (Rudd et al., 2015).

The Slee et al. (2008) study had very serious limitations, which ultimately resulted in a GRADE of very low quality. Although this study had a randomized control design, the numerous limitations regarding quality, consistency and directness called for several mark downs in points. Not only did the authors also use self-reporting (invalidated outcome measure) for secondary outcomes, they also used an invalidated primary outcome assessment, Structural Clinical Interview, throughout the study (Slee et al., 2008). Therefore, any information gathered using these measures is automatically called into question, and can be seen as unreliable. Next, the author's explanation of their randomization process was unclear, as they stated they used both "computer randomization and random-number generator by an independent investigator"; not including how and when each process was conducted (Slee et al., 2008). As well, not mentioning why they needed to use the two different randomization processes. Another quality limitation was the absence of an extended follow up period of at least 12 months, which was advisable by the authors because there risk of repeated self-harm is greater in that time period (Slee et al., 2008). Lastly, a major quality limitation Slee et al. (2008)

suffered was that assessments after baseline were not carried out masked to treatment the groups, thus there's no way to tell if the lack of concealment influenced the outcome in both primary and secondary measures.

Limitations regarding consistency centered around the patients in the TAU only arm not always receiving psychotherapy, as the CBT+TAU group did, so this lack of factor control suggest [dosage] uncertainty if CBT treatment effects are from CBT treatment alone or CBT+TAU (Slee et al., 2008). Last of all, the absence of sample diversity limits the directness of this study. Only young Dutch women of a specific region were included, thus this sample's finding cannot be generalizable to any military population. Also, because the specific percentage amount of women over 18 years of age in the sample wasn't able to be ascertained, the level of effectiveness on adult women can't be certain. The overall limitations withstanding, along with other research in the field, I feel the results of effectiveness are still reliable and are applicable to practice.

There are a few methodological shortcomings that may have affected my view of the results of this systematic review. Initially, due to the lack of consideration towards the female military population in regards to evaluating the effectiveness of interventions on suicidal behavior, I was only able to include a small quantity of studies that both had relatively small and non-generalizable studies. Limiting my search to only include RCT's may have also caused me to miss out on potential papers, as well as the limits to only scholarly, peer-reviewed articles published in English. A strength of my review method is that by setting such strict limitations, I was able to produce the most relevant studies evaluating the effectiveness of CBT on suicidal behavior towards my population of interest. Although, neither studies' population addressed the complete aspect of my intended population, the combined perspective from the results of each provided insight into possible effectiveness regarding my PICO of interest. Also, due to the specificity of

my research question and inclusion/exclusion criterion, I was able to provide an accurate assessment of the lack of studies available in regards to this PICO, even though current research suggest that there is an urgent need.

Conclusions

The results of this systematic review are comparable to the conclusions found in the original replication study. The Tarrier et al. (2008) systematic review also found that clinical trials evaluating CBT on suicidal behavior are relatively recent. Likewise, the included studies sampled populations from two distinct Countries/cultures, but were able to show a cross study effectiveness of CBT on reducing aspects of suicidal behavior (Tarrier et al., 2008). Another conclusion found in the Tarrier et al. (2008) study was that there was a significant treatment effect on participants when the CBT treatment is primary focused on suicidal behavior as a primary outcome and not in conjunction with reducing psychiatric symptoms. Results from Rudd et al. (2015) support this conclusion by showing that CBT+TAU intervention caused a reduction in suicidal behavior, regardless of symptom severity, because it focused on emotion regulation and problem-solving skill development. This finding has important implications regarding the military in general due to the high comorbidity of suicidal behavior and mental illness within the population. Having an effective, time-limited treatment to lessen or completely remove the high risk nature of suicidal behavior may allow military persons to have more focus and energy to put towards other psychological treatment that may require more time (Rudd, 2012). Although the Slee et al. (2008) study showed an opposite finding of CBT+TAU having primary effect on secondary measures, followed then by an effect on self-harm, the study still supports the notion that CBT+TAU targets the mechanics of suicidal behavior separately.

Implications towards existing research in the field show that a time-limited CBT intervention is effective on adult populations. Other research found during the scoping search revealed certain trends in the types of studies currently evaluating the effect psychological interventions have on some aspect of suicide. In regards to certain government publications (VA), the focus of research seems to be on suicide prevention, retroactive studies and current studies assessing certain risk factors for subgroups in the military or documentation of overall suicide rates. While this type of research is needed to give perspective on who and what needs intervention, the multiplicity of publications on this area show a need to move from assessing risk to intervening. Suicide rates rise every year and generally double the general population for military servicemen, due to their unique risk factors (Rudd, 2012), which suggest both an available population (or sub populations) to study as well as an urgent need for intervention.

Tarrier et al. (2008) notes that there was a limited number of CBT studies with adolescent populations (noted as well that CBT wasn't as effective on suicidal behavior in this population as with adults), however this trend seems to have flipped in the years between 2008 to the present. There were more studies found during this systematic review search that focused on adolescents or children as the population, than there were adults. In terms of outcomes measured (other than suicidal behavior) in CBT intervention studies, the most relevant to the military population studied were PTSD and for females specifically, Military Sexual Trauma. In the general population, the most relevant outcome measure found in female population was Borderline Personality Disorder (BDP).

Dialectical Behavior Therapy (DBT) studies were the most relevant research found with comparable effects on reducing suicidal behavior. Although some literature doesn't delineate between DBT and CBT, there are a few significant differences to be noted. First, DBT is a third-wave therapy, largely founded from CBT and uses similar

techniques with important distinction between its emphases on mindfulness vs. CBT's primary focus being on change (Harrington & Pickles, 2009, p. 319). Another important distinction between the two behavioral therapies is the treatment time. CBT is specifically time-limited, with effectiveness found in as few as 10-12 sessions, as further supported by evidence presented in the Slee et al. 2008 and Rudd et al. 2015 studies included in this systematic review. On the other hand, "DBT standardized treatment format is at least 12 months in duration" (Tarrier et al., 2008, p. 86). This factor is further evidence by a 2007 systematic review and meta-analysis that found "significant differences…showed that the third wave studies had longer therapies and higher number of therapy hours" (O¨st, 2007, p. 5). This element has significant implications on the applicability and cost effectiveness of treatment in high risk populations, such as the military, who's noted patient issue to treatment being the high mobile environment (Rudd et al., 2015). The brief versions of CBT the included studies used are a slight extension of traditional CBT and not its own separate faction. Its effectiveness is further reinforced by Rudd (2012), "BCBT was developed and adapted to the unique treatment environment of a military setting…that limits the ability to offer intensive and enduring psychotherapy" (p. 592).

A final important distinction between the two interventions is that DBT was crafted to specifically have an effect on populations with a primary diagnosis of BDP (Linehan & Schmidt, 1995, p. 553). Although, some research may point to women having a higher percentage of a BDP diagnosis, which could point to relevant use of DBT, the military population overall is diverse with multiple psychiatric illness that range in severity. DBT has been adapted to a few other illness, such as eating disorders, however, for larger effectiveness in the military population, among females specifically, CBT and its heavily studied efficacy on a wide range of Axis 1 and Axis 2 diagnosis will have greater

implications for generalizability and cost-effectiveness (Rudd, 2012). For these significant differences, studies using DBT as a primary intervention were excluded.

Ethical Implications

Ethically, the lack of clinical trials addressing the high rate of suicidal behavior in female military servicewomen is a challenge to the Social Work Code of Ethics of social justice, service and competence. As social workers, we have sworn a duty to advocate on behalf of the "vulnerable and oppressed" (National Association of Social Workers [NASW], 2008). In society as a whole, females more so than males face numerous challenges due to the intersection of their gender as well as other identification factors such as race, sexuality, etc. These challenges are only heightened in the overall masculine environment of the military, were women have even less "freedom" and even more exposure to potential dangers. This in turn may cause them to have higher risk factors for suicidal behavior.

Knowing this, social workers have an ethical obligation to both petition for government and other agencies such as the VA to fund research specific to this population, as well as be at the helms of their own clinical trials. Without these trials, ethical competence cannot be fully attained, and as primary clinical professionals involved with treatment within military populations, it is a serious concern that we don't have effective means of treatment for a behavior with such a deadly outcome.

Conclusion

In conclusion, the combined results of the included studies show some evidence that CBT intervention is more effective at reducing suicidal behavior in a female active duty population than TAU. However, due to severe limit of clinical trials available, poor study quality and individual study limitations on directness towards the intended population, effectiveness cannot be definitively concluded.

Future Directions

Future research is needed to focus on both the volume of clinical trials conducted and the specificity of female military populations studied in evaluating CBT as an intervention on suicidal behavior. Current research on suicide prevention provided by academic and government agencies have presented enough data of the relevance and high risk to warrant such studies; because without them, finding an effective, scientifically researched intervention for this vulnerable population is highly unlikely.

Appendix A

Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years	

		considered, language, publication status) used as criteria for eligibility, giving rationale.	
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	
Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I2) for each meta-analysis.	

Section/topic	#	Checklist item	Reported on page #
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	
DISCUSSION			
Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	

Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	

Appendix B

Criteria for GRADE

Type of evidence	Randomized trial = high Observational study = low Any other evidence = very low
Decrease* grade if	• Serious (-1) or very serious (-2) limitation to study quality • Important inconsistency (-1) • Some (-1) or major uncertainty (-2) about directness • Imprecise or sparse data (-1) • High probability of reporting bias (-1)
Increase grade if	• Strong evidence of association—significant relative risk of > 2 (< 0.5) based on consistent evidence from two or more observational studies, with no plausible confounders (+1) • Very strong evidence of association—significant relative risk of > 5 (< 0.2) based on direct evidence with no major threats to validity (+2) • Evidence of a dose response gradient (+1) • All plausible confounders would have reduced the effect (+1)
Range	High quality evidence Moderate quality evidence Low quality evidence Very low quality evidence
*	Each quality criteria can reduce the quality by one or, if very serious, by two levels.

*GRADE indicates Grading of Recommendations, Assessment, Development, and Evaluation
(GRADE WORKING GROUP, 2006)

Appendix C

Literature Search Categories and Terms

[MESH SEARCH TERMS: AND/OR]
("Veterans"[Mesh] OR "Veterans Health"[Mesh] OR "Military Personnel"[Mesh] OR "Military Family"[Mesh] OR army OR navy OR military OR "active duty") AND ("Cognitive Therapy"[Mesh] OR CBT OR "cognitive behavior therapy" OR "cognitive behavioral therapy") AND ("Suicide"[Mesh] OR suicide)
[Database Terms:]/ [Academic Journal Terms:]/ [Google Scholar/Web of Science Terms:]
combat vet* + therapy+ suicide femal* veteran + cognitive behavioral therapy women OR femal* + soldier+suicide (Female OR Woman) AND (Veteran OR Active Duty) AND (Cognitive Behavioral Therapy) AND (Suicide Attempt or Suicide Completion
military + cognitive behav* + suicide femal*+ military +suicide femal*+veteran+suicide self-injur* behavior attempt* suicide deliberate OR self-harm OR injur* OR poison suicd* AND episode*
(Female OR Woman) AND (Veteran OR Active Duty) AND (Cognitive Behavioral Therapy) AND (Suicide Attempt or Suicide Completion) combat vet* + therapy+ suicide femal* veteran + cognitive behavioral therapy women OR femal* + soldier+suicide

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Biographical Information

Alletia Smith earned her Bachelor of Science in Communication Studies from the University of Texas at Austin (UT) and her Master of Science in Social Work from the University of Texas at Arlington (UTA). Although she originally planned to go to law school, her wanderlust for travel motivated her to move across the world to teach in South Korea. It was there, volunteering to teach orphans how to read, write and speak English that she decided to change courses from law to social work. Feeling she could make more of an impact working with clients in a more holistic manner than strictly from a legal perspective. Her current research interest is social work health care policy, especially within military populations. Her future plan is to pursue a social work fellowship to gain more clinical experience and soon thereafter, obtain a Doctorate degree and work for the government constructing integral policy for this population.