RUTGERS
School of Nursing

DOCTOR OF NURSING PRACTICE (DNP) PROGRAM

A DNP PROJECT

Comparison of PHQ-8 and Beck Depression Inventory II in the Army National Guard

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Abstract

Purpose: The purpose of this project was to determine whether the Beck Depression Inventory (BDI)-II or the Patient Health Questionnaire (PHQ)-8 would be a more effective assessment tool for identifying depression in Army National Guard (ARNG) soldiers during their annual periodic health assessment.

Methodology: A normative comparison study of the BDI-II and PHQ-8 to detect depression in adults. Both were distributed to ARNG soldiers who self-reported during their annual periodic health assessment (PHA) over the three month period.

Results: A total of 841 surveys were distributed. A total of 136 surveys were returned, of which 115 were complete and used for data analysis. Findings were compared using Pearson's R correlation and examined whether there were statistically significant differences in the results of the BDI-II when compared with the PHQ-8. There was a positive linear correlation between the two tools, r=0.86, n=115, p=0.05. The coefficient of determination (r^2) was 0.73. Overall there was a good, positive correlation between Beck's Depression Inventory II and depression scores. The Cronbach's alpha of the completed Beck's Depression Inventory II was 0.91 (95% CO=0.8657, 0.9337) whereas the Cronbach's alpha of the PHQ-8 was 0.82 (95% CI=0.749, 0.8719).

Implications for Practice: The current mandated screening tool for depression is the PHQ-8. However, the New Jersey Adjutant General, Medical Command, and the New Jersey State Surgeon have the authorization to improve the standard operating procedure including both BDI-II and the DoD approved PHQ-8 screening tool to satisfy all current regulations and potentially decrease the amount of suicide attempts and/or deaths within the NJARNG.

Keywords: depression screening, Army Reserve National Guard, PHQ-8, Beck's Depression Inventory-II

Piloting Becks Depression Inventory II in the Army National Guard

The United States military has been engaged in the longest period of war in its history. Since 2001 the military has been engaged in not just one, but two simultaneous conflicts, Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF). As a result, the stressors imparted on the members of the military are like none ever before seen. Research suggests that these stressors have directly or indirectly played a role in the increased rate of suicide in the United States military. It is currently the highest it has ever been in recorded history (Bah et al., 2011; Cersovsky, 2011). In the past, the suicide rates in the military has been below the civilian rate, and during times of war the rate of suicide in the military has declined (Griffith, 2012a; Griffith, 2012b; Rothberg, Ursano, & Holloway, 1987). However, in the recent conflicts, the opposite occurred. As the suicide rate in the military as a whole continued to rise, each component saw their own variations in the rise; with the Army National Guard (ARNG) seeing the sharpest (Luxton et al., 2011; Pruitt et al., 2014; Smolenski et al., 2012; Smolenski et al., 2013). In 2011, the total Army's suicide of rate of 22.9 per 100,000 (Luxton et al., 2011) was still rising, at almost double the United States civilian rate of 12.4 per 100,000 (Heron, 2013). In the most recent Department of Defense Suicide Event Report (DoDSER), the National Guard suicide rate (21.5 per 100,000) is surpassed only by the Active component (23.8 per 100,000) (Pruitt et al., 2014). The previous year, the National Guard was still the component with the highest rate of suicide (33.7 per 100,000) (Pruitt et al., 2014)

In order to reduce the rate of suicide in the military, the Department of Defense (DOD) has instituted annual depression screenings for military personnel. Depression is consistently seen in the literature as a predictor of suicidality (American Psychiatric Association & DSM Task Force, 2013; Hough & Lewis, 2010; Mościcki, 2001; Nock, 2011; Pfeiffer et al., 2014).

The Patient Health Questionnaire (PHQ-8) is the current screening tool for assessing depression in the military. This tool has never been appropriately evaluated in a National Guard sample although it is used exclusively in the annual PHA to identify depressed soldiers. A different assessment tool may be more effective in screening depression for this population. The goal of this study was to determine whether the PHQ-8 or the Beck Depression Inventory-II was a more effective assessment tool for identifying depression in ARNG soldiers during their annual PHA.

Background & Significance

Understanding the different experiences of soldiers in the Army Active, Reserve, and ARNG is vital to understanding the discrepancy in suicide rates among these different service components. The Active component of the Army is comprised of full time military service similar to that of a full time civilian job. Active duty service members generally live on base or military housing which provides an abundance of support services for service members and their families. In addition to these services, living on base immerses active duty service members and their families in military culture and others are able to relate and support each other throughout lengthy deployments.

The Reserve is a part time commitment under federal control which provides and maintains trained units at home while active duty service members are deployed. Each Active branch has a Reserve component available for Active duty service in times of war of national emergencies. These units do not have combat forces but provides combat support services. ARNG is also a part time commitment who is under both federal and state control. The main focus of an ARNG soldier is homeland security, humanitarian relief and state emergencies like storms, fires and other natural disasters. The ARNG has combat forces available and have deployed in support of OIF and OEF in that capacity (Ham et al., 2016). Reserve and ARNG

members may not live close to their home installation. Some may even live in a different state from where their unit is based. As a result, Reserve and ARNG members may have limited access to resources or support services compared to their Active component counterparts. This is even more evident during a deployment. While serving in the military is the Active service member's career, a Reserve or ARNG member leaves their civilian career or job to go on a deployment. There are various stressors associated with this, such as service members losing their civilian jobs, changes in income, changes in health insurance, and lack of unit cohesion during the deployment. These stressors are multiplied for the Reservist or ARNG service member who has a family, and a spouse who is not used to the new lifestyle a deployment entails. For many of these service members, a return from a deployment can mean the end of a relationship or marriage, financial and health problems, depression and eventually suicide (Griffith, 2012b; Griffith, 2016; Martin, Houtsma, Green, & Anestis, 2016).

There has been much published hypothesizing on the rise in the suicide rate. Research suggests the number and length of deployments may lead to in increased risk for suicide (Friedman, 2014; Griffith, 2012b; Hyman, Ireland, Frost, & Cottrell, 2012; Kline et al., 2010; Schoenbaum et al., 2014). However, other published research determined that deployed veterans showed a lower risk of suicide compared with non-deployed veterans and multiple deployments were not associated with the excess suicide risk among deployed veterans (Kang et al., 2015; LeardMann et al., 2013). Depression is consistently seen in the literature as significant predictor of suicidality (American Psychiatric Association & DSM Task Force, 2013; Hough & Lewis, 2010; Mościcki, 2001; Nock, 2011; Pfeiffer et al., 2014).

Needs Assessment

It is logical to deduce, if depression is a major predictor of suicidality, assessing for depression will be an important intervention that could reduce the rate of suicide in the military. The DoD has been working to improve its depression assessment of military personnel since the rise of the suicide rates in the military. In 2011 a new process was established to assessing suicide risk, specifically depression (United States Army Medical Command, 2011).

Army Process for Identifying Depression

The process the Army has established includes five Touch Points as an integral part of the Army Force Generation Cycle (ARFORGEN) in Army Regulation (AR) 525-29 (United States Army Medical Command, 2011). The five Touch Points refer to predetermined time frames when a Soldier will be medically and psychologically assessed. The behavioral health tool the Army has chosen to use to assess for depression is the PHQ-8 that is completed online followed by a face-to-face assessment.

A Pre-Deployment Health Assessment (Pre-DHA) is completed prior to a Soldier's deployment and is referred to as Touch Point 1. During a deployment, or "In-theater," a Soldier will complete Touch Point 2. This can occur at any time throughout their 12 to 18 month deployment. Within 30 days of returning home from a deployment, Touch Point 3 occurs and the Soldier completes the Post-Deployment Health Assessment (PDHA). The next Touch Point is the Post-Deployment Health Reassessment (PDHRA), Touch Point 4 is completed within 90–180 days upon return from a deployment. Touch Point 5 is the Periodic Health Assessment (PHA). Touch Point 5 is performed every year when a Soldier is not deployed and is completed during the Soldier's assigned unit's annual cycle (United States Army, 2011b; United States Army Medical Command, 2011).

Evaluation of Process

In September 2015, Army Public Health Command (APHC) released the 2011 Behavioral Health Risk Assessment Data Report (BH-RADR) detailing the evaluation of this new process ordered by AR 525-29. At the writing of this paper, Touch Point 5 has not been evaluated. The report including Touch Point 5 research was due to be published in June 2016, but has yet to be released (United States Army Public Health Center, 2016). The 2011 BH-RADR performed psychometric testing on Touch Point 3 and Touch Point 4. In both Touch Point 3 and Touch Point 4, psychometric testing of depression was performed concurrently with testing of the PTSD scales. No demographic data is reported of the soldiers who completed either Touch Point 3 (n = 29,892) or Touch Point 4 (n = 8,019). However, of the soldiers who screened positive during Touch Point 3 for symptoms of PTSD and/or depression (n=2,067) the majority (72%) of the soldiers were active duty service members (n=1,493). Of the soldiers who screened positive for symptoms of PTSD and/or depression (n=1,036) in Touch Point 4, the majority (87%) of the soldiers were active duty service members (n=852). The report identifies the sensitivity and specificity of the PHQ-8 during both Touch Point 3 and Touch Point 4. However, the conclusion was that their findings were inconclusive. The report states the data is inconclusive because many tools were not completed to accurately. There were problems with the proper administration of the tools and assessments, and screeners were not trained properly. Of the issues identified in the testing, one of the most important was the inequality of the test in an ARNG sample. The demographic data released does not indicate past active duty or how much of the sample were the Reserves or ARNG. As discussed earlier, the ARNG has seen the highest rates of suicide, and the sharpest rise in suicide (Luxton et al., 2011; Pruitt et al., 2014; Smolenski et al., 2012; Smolenski et al., 2013).

New Jersey Army National Guard

Every month, the Medical Detachment (MED-DET) unit in the New Jersey Army National Guard (NJARNG) performs PHA's (Touch Point 5) on multiple units in the NJARNG. The NJARNG currently maintains a fighting force of over 8,300 soldiers, and the MED-DET performs PHAs on an average of 600 soldiers each month (New Jersey Army National Guard, 2017). As instructed by the United States Army Medical Command Operation Order (OPORD) 10-70, during the PHA, each Soldier answers the PHQ-8 and an assessment by a qualified clinician (United States Army Medical Command, 2011). As outlined by Department of Defense Directive Number (DoDI) 6490.14, a qualified provider may be an independently licensed mental health care provider or a trained and certified health care provider such as a physician, physician assistant, nurse practitioner, advanced practice nurse, independent duty corpsman, special forces medical sergeant, independent duty medical technician, independent health services technician, or mental health technician who has completed the certification training developed by the Office of the Deputy Assistant Secretary of Defense Force Health Protection and Readiness and the Deployment Health Clinical Center (Carter, 2013).

Beck Depression Inventory II vs PHQ-8

The Beck Depression Inventory II (BDI–II) is the most widely used instrument for detecting depression. This screening tool consists of 21 statements arranged in increasing severity about a particular symptom of depression to assess the intensity of depression over the preceding two weeks to satisfy the current DSM-IV guidelines for assessing depression symptoms. The BDI-II showed improved clinical sensitivity, with the reliability (Coefficient Alpha = .92) higher than the PHQ-8 (Coefficient Alpha = .86) (Beck Steer, Ball, & Ranieri, 1996; Davison & Neale, 2001; Kovacs, 1992; Kovacs & Staff, 2003).

Problem Statement

Of the various branches and components that comprise the Unites States military, the sharpest rise in the rate of suicides were among the ARNG (Bah et al., 2011; Cersovsky, 2011; Luxton et al., 2011; Pruitt et al., 2014; Smolenski et al., 2012; Smolenski et al., 2013). One of the most commonly discussed predictors of suicide in the literature is depression (American Psychiatric Association & DSM Task Force, 2013; Hough & Lewis, 2010; Mościcki, 2001; Nock, 2011; Pfeiffer et al., 2014). Currently, the military has not found an effective way to intervene with soldiers who are exhibiting suicidality. One of the problems may be that although many tools are available to assess for depression, they must be appropriate for the population they are assessing. The Army currently assesses every Soldier for depression yearly, at a minimum (United States Army Medical Command, 2011). However, the assessment tool used for Active Army is not necessarily appropriate for the ARNG, the component with highest rate of suicide (Luxton et al., 2011; Pruitt et al., 2014; Smolenski et al., 2012; Smolenski et al., 2013; United States Army Public Health Center, 2016). The 2011 BH-RADR had inconclusive results. ARNG soldiers were not identified in this report, which means that the percentage of soldiers with a positive identification of depression (72% at Touch Point 3 and 87% at Touch Point 4) from the ARNG is unknown. The question addressed by this study was whether the BDI-II identified ARNG soldiers with depression more effectively than the PHQ-8?

Clinical Question

During a 3-month period did the BDI-II reveal more depression among the NJARNG's than the PHQ-8 when used during their annual PHA at the medical facility at the National Guard Training Center in Sea Girt, NJ?

Aims & Objectives

The aim of this study was to develop a standard operating procedure (SOP) using an effective depression screening tool during the annual PHA by the MED-DET of the NJARNG. Prior to the development of this SOP, the objective of this study included comparing the results of the PHQ-8 vs the BDI-II of NJARNG soldiers when they were screened for depression during their annual PHA over a 3 month period.

Review of Literature

A thorough review of the literature was conducted with critical appraisal (see Appendix A). As the United States became involved in two simultaneous conflicts, the rate of suicide began to rise among Service Members (SM). Of the various branches and components that comprise the United States military, the sharpest rise in the rate of suicides were among the ARNG (Bah et al., 2011; Cersovsky, 2011; Luxton et al., 2011; Pruitt et al., 2014; Smolenski et al., 2012; Smolenski et al., 2013). One of the most commonly discussed predictors of suicide in the literature is depression (American Psychiatric Association & DSM Task Force, 2013; Hough & Lewis, 2010; Mościcki, 2001; Nock, 2011; Pfeiffer et al., 2014). The stressors imparted to the members of the military are like none ever before seen. These stressors may have directly or indirectly played a role in the rates of suicide in the United States military having risen to the highest rate in its recorded history (Bah et al., 2011; Cersovsky, 2011).

As previously discussed, depression is cited in the literature as a significant predictor of suicidality (Hough & Lewis, 2010; Mościcki, 2001; Nock, 2011; Pfeiffer et al., 2014). Joiner et al. (2009) conducted a research study with 815 participants comparing the various components of the Interpersonal-Psychological Theory to depression, family history, and suicide attempts. The study found that participants with a six month to lifetime history of depression predicted suicide

ideation $F (2, 812) = 82.43$, $p < .05$. However, thwarted belongingness and burdensomeness predicted suicide ideation beyond depression $F (2, 810) = 17.31$, $p < .05$. Joiner et al. (2009) does not include depression into the Interpersonal-Psychological Theory. Rather, he tests the theory against depression and concludes the theory is a better predictor of suicidality than depression (Joiner et al., 2009). Other researchers have demonstrated an association between hopelessness and depression (Cuijpers et al., 2013). Cuijpers et al. (2013) conducted a meta-analysis of 13 research articles and 616 study participants. In a meta-regression analysis, using the effect size of hopelessness as the dependent variable and the effect size of depression as independent variable, there was a significant association (slope: 0.74; 95% CI: 0.49–1.00; $p < 0.001$) between the two variables.

The DoDSER reports 55.2% of service members who completed suicide and 70.75% of service members who attempted suicide had a previous diagnosis of depression (Smolenski et al., 2013). The rate of depression in veterans is not reported in their official suicide data report (Kemp & Bossarte, 2014), but the National Alliance of Mental Illness (NAMI, 2009) reported their research indicates 14% of all veterans suffer from depression and 95% of veterans completing suicide had a diagnosis of depression. In their prospective longitudinal study to identify risk factors associated with suicide in current and former military personnel included in the Millennium Cohort study ($N = 151,560$), depression was strongly associated with an increased risk of suicide (LeardMann et al., 2013). In their retrospective multivariate analysis of all U.S. military personnel between 2001 and 2011 ($N=110,035,573$ person-quarter-years, representing 3,795 SMs), current and/or past diagnosis of major depression was a strong predictor of death by suicide, either during service or post-separation (Shen, Cunha, & Williams,

2016). The NAMI reported that 14% of all Veterans suffer from depression and 95% of Veterans completing suicide had a diagnosis of depression (NAMI, 2009).

In 1967 Aaron Beck initially constructed and introduced the Beck's Cognitive Theory of Depression (Beck, 1997). He proposed that negative emotions and feelings manifest into automatic, inaccurate, and potentially destructive thoughts. The three primary subject matters that compose the "negative cognitive triad" consist of negative thoughts about self, the environment, and the future (Beck, Steer, R. Ball, & Ranieri, 1996; Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). This continuous pessimistic thinking causes a person to interpret their experience and interactions negatively and therefore increases vulnerability to depression. When this cycle of negative thinking is triggered by a stressor or adverse event it downward spirals into feelings of helplessness and depression. Understanding Beck's Cognitive Theory of Depression and the ability to identify this distorted thought process may lead to early intervention and prevention of depression development (Beck, Steer, Ball, & Ranieri, 1996; Beck, Steer, & Brown, 1996; Beck et al., 1961; Beck, 1997). Implementing the conceptual ideas outlined in Beck's Cognitive Theory of Depression when screening ARNG soldiers for depression may allow for identification of the negative cognitive triad themes discussed by Beck. Early identification and intervention can break the negative cognitive triad thought process and cease depression development. Application of this knowledge to improve the mental health of ARNG soldiers will allow for a more comprehensive approach to their overall health and wellbeing when caring for our service members, ultimately conserving the fighting strength of ARNG soldiers. A long-term aim is to progress this research throughout the military to benefit all SMs. Depression is a complex phenomenon. It is the result of, and can lead to many other forms of adverse behaviors, such as suicidality.

Beck developed multiple screening tools to identify depression. The first screening tool was the Beck's Depression Inventory (BDI) which was published in 1961. Later this tool was revised to the BDI-IA in 1978. However, the BDI-IA only addressed six out of the nine DSM-III criteria for depression and was criticized for these flaws. The current revision, the BDI-II, was published in 1996. This screening tool was developed in response to the American Psychiatric Association's publication of the Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, which changed many of the diagnostic criteria for Major Depressive Disorder (MDD). There have been many tool revisions, but the original framework has stayed the foundation for additional screening tools (Beck et al., 1996). The theory has shown to last the test of time and is still applicable to practice today. The screening tools developed from this framework have limitations, mainly being self-reporting inventories. Participants may minimize inflating their responses and results may be positive due to situational stressors or environments that the individual completing the screening is currently experiencing. These tools are designed to identify at-risk individuals for depression and not diagnose depression. However providers will sometimes use this tool as a "quick diagnosis." Additional screening tools that have been developed based on the Beck's Cogitative Theory of Depression are the Beck Anxiety Inventory, Beck Hopelessness Scale, Beck Scale for Suicide Ideation, Beck Youth Inventories, Clark-Beck Obsessive-Compulsive Inventory, and BDI-Fast Screen for Medical Patients designed for adolescents and adults (Beck et al., 1996; Davison & Neale, 2001; Kovacs, 1992; Kovacs & Staff, 2003).

Theoretical Framework

The Knowledge to Action (KTA) Framework is a conceptual framework that was created with the intent to convey and uphold evidence-based interventions in practice. The knowledge

creation component and the action cycle are overlapping and repetitive to allow for continuous reassessment and adaptability throughout the ongoing depression assessment (Field, Booth, Ilott, & Gerrish, 2014). The information obtained in the needs assessment activates the knowledge creation cycle. The needs assessment will be applied to the NJARNG depression screening process during their annual PHA and in turn, activates the action cycle. This information is used to tailor an individualized assessment that is flexible in a potentially uncertain screening (see Appendix B).

The literature review and needs assessment addressed the knowledge inquiry block of knowledge creation. The PHQ-8 and BDI-II are the product tools chosen to address the identified problem of depression screening in a NJARNG sample. The information and tools identified make up the knowledge creation component of the KTA framework. Once the knowledge creation cycle is set into motion, this can be applied to the action cycle of the KTA framework. During this application of knowledge, the knowledge gained is applied directly to the NJARNG sample, adapting to the local context. Next, the barriers of the knowledge are reassessed on an ongoing basis throughout the action cycle. If any barriers are encountered, the process will be tailored accordingly. Monitoring of this action cycle will occur on an ongoing basis and outcomes will be evaluated to support the knowledge that was acquired in the knowledge inquiry block (Graham et al., 2006).

Methodology

This study is a normative comparison study of two research tools designed to detect depression in adults. The tools that were compared were the PHQ-8 and BDI-II. Subjects were asked to fill out both of the screening tools found in the medical folder during their annual PHA. This was a fast, inexpensive study that provided a solid foundation useful for a follow up cohort

study (Setia, 2016). Being that this study involved a survey being performed on DOD personnel, DOD approval was obtained before the research commenced.

Setting

This study was conducted at the National Guard Training Center and MED-DET located in Sea Girt, NJ. This is the home location of MED-DET and where all PHA's are completed for NJARNG soldiers.

Study Population

Every month, the MED-DET in the NJARNG performs a PHA on multiple units in the NJARNG to assess for medical readiness and fighting strength of New Jersey. The NJARNG currently maintains a fighting force of over 8,300 soldiers, and the MED-DET performs PHAs on an average of 600 soldiers each month (New Jersey Army National Guard, 2017). Soldiers that completed the PHA process were representative (in terms of age, gender, race/ethnicity and rank distribution) of the entire NJARNG and the military as a whole. The current race/ethnic distribution of the ARNG included 56% White, 21% Black, 15% Hispanic, 6% Asian, and 2% of other races/ethnicities. A total of 41% were married; 81% were male; 34% were 25 years or younger, 19% were 26 to 30 years of age, 15% were 31 to 35 years old, 11% were 36 to 40 years of age, and 21% were over 41 years old. This distribution was similar to that of the Army's Active and Reserve components (Military One Source; The Office of Army Demographics, 2017). Minimal age of enlistment was age 18. No one younger than age 18 was present for screening. Maximum age for retirement was 62. No one older than age 62 was present for screening. While a total of 1000 soldiers were screened using the BDI-II and PHQ-8 only 500 soldiers would be used for the sample size, randomly selected over the three month period for data collection. The consent form and screening tools were randomly placed in the

medical health folders prior to the PHA event by the PI. These folders were distributed at the PHA check in station. Distributing 1,000 packets over the three month time period increased the variability of the total screened sample versus collecting the total sample on one drill weekend. The inclusion criteria consisted of actively drilling members of the NJARNG who received the PHA during the study period. Exclusion criteria were members of the NJARNG that were unwilling to participate in this study.

Subject Recruitment

During the units annual standardized timeframe of evaluation participants were recruited for this study. In the morning of the PHA soldiers wait in a holding area for the morning brief prior to the start of the PHA. The PI addressed the soldiers (see Appendix C) outlining the aims, procedures, and participation criteria as outlined above. If the study packet was present in their medical health folder they were asked to read the consent form and if they decided to participate, sign the consent form and fill out both the PHQ-8 and the BDI-II. It was stressed that participation in the study was not required but completion of the PHA was mandatory as instructed by the United States Army Medical Command Operation Order (OPORD) 10-70. If individuals had additional questions, required clarification, or opted out of the proposed study the PI was readily available to address and issues. Participants were also made aware that the study was approved by the Rutgers Institutional Review Board (IRB), National Guard Bureau (NGB), Army Human Protections Office (HARPO) and the New Jersey Adjutant General (TAG). All steps were taken to minimize the possibility of coercion or undue influence. Superiors did not influence the decisions of their subordinates regarding participation in this study. MED DET superiors were not present at the time of recruitment and consent. The PI was

on site to answer any additional questions regarding the study and was able to be reached immediately by calling 732-814-7764.

Consent Procedure

The Rutgers adult consent form (see Appendix D) was used to obtain voluntary, written consent to utilize the information on the paper PHQ-8 (Appendix E) and BDI-II (see Appendix F) for data collection and study purposes. The consent forms were in the study packets that were placed in the medical health folder prior to the PHA event. These folders were received once they checked in to the PHA event. All of the folders contained the standard medical health forms, the 1,000 randomly selected folders included a Rutgers adult consent form with a written BDI-II and PHQ-8 attached. If a soldier decided to participate, they filled out the consent form. Once the consent form was complete then they filled out the BDI-II and PHQ-8 in its entirety. Completion of the annual PHA is mandatory as instructed by the United States Army Medical Command Operation Order (OPORD) 10-70 which included the online PHQ-8. Only the paper form of the PHQ-8 was voluntary for completion and data collection. These forms could have been completed at any time throughout the day prior to PHA check out and took no more than 15 minutes to complete both questionnaires. If they chose not to participate they did not fill out the consent form, BDI-II and PHQ-8. The remainder of the forms were filled out by the soldiers in the usual manner. At any time during the PHA, the soldier returned their completed, written study packet in to one of two marked, locked, Rutgers' drop boxes that was placed throughout the building. Only the PI had key access to this locked drop box and documents. The drop boxes were added to assure subjects of anonymity and reduce any feelings of coercion from peers or superiors by providing a secure site to submit their forms. No one knew what forms were filled out until the drop box was open. Prior to the end of duty day the PI reviewed all study packets

for positive responses on the depression screening tools. Any positive screenings from either the BDI-II or PHQ-8 were reported to the chain of command for mental health referral and evaluation. A positive BDI-II, even if there was no positive screening on the PHQ-8 was reported to the chain of command for additional mental health referral and evaluation. If the forms within the study packet were incomplete or missing it was noted that the soldier opted out of participating in the study and no information was obtained for study purposes.

Risks/Harms

Due to the increased incidences of suicide in this population greater than minimal risk was assumed. In situations where an unanticipated emotional reaction occurred, the ARNG standard operating procedure for depressed and suicidal soldiers was followed to ensure the safety and wellbeing of that individual. Mental health workers were onsite and were available for immediate face to face crisis screenings. Based on the direction of the mental health worker either transportation was provided to the designated emergency department for a crisis screening or an appropriate follow up plan was initiated based on the soldiers specific needs. No adverse reaction occurred during the duration of this this study. Participants did not receive any direct benefit for participation in this study.

Although every precaution was taken to keep the information confidential it is possible that there could have been a breach of confidentiality. Examples of confidentiality breaches include but are not limited to lost or stolen laptop storing participant information, lost or stolen zip drive with unencrypted participant information or papers without PHI not disposed of properly.

Subject Cost and Compensation

No compensation was provided to soldiers who participated in this study. There was no cost associated with participating in this project.

Study Protocol

The Rutgers adult consent form was used to obtain voluntary, written consent to utilize the information on the paper PHQ-8 and BDI-II for data collection and study purposes. The consent forms were within the study packets that were placed in the medical health folder prior to the PHA event. These folders were received once they checked in to the PHA event. All of the folders contained the standard medical health forms, the 1,000 randomly selected folders also included a Rutgers adult consent form with a written BDI-II and PHQ-8 attached. If soldiers decided to participate they filled out the consent form. Once the consent form was complete then they filled out the BDI-II and PHQ-8 in its entirety. The remainder of the forms were filled out by the soldiers in the usual manner. At any time throughout the PHA, the soldier returned their completed study packet in a specialty marked, secure, Rutgers drop box that was placed throughout the building. Only the PI had access to these drop boxes and documents. Before the end of duty day the PI reviewed all of the study packets for positive responses on the depression screening tools. Soldiers who were not previously identified as depressed on the PHQ-8 but were on the BDI-II were identified and immediate notification through their chain of command occurred for mental health referral and evaluation. If the forms within the study packet were incomplete or missing it was noted that the soldier opted out of participating in this study and no information was obtained for study purposes. Superiors did not influence the decisions of their subordinates regarding participation in this study. MED-DET superiors were not present at the time of recruitment and consent.

Outcome Measures

A positive result on the PHQ-8 was numerical value equal to or greater than 10. The BDI-II numeric score of 14-19 indicated "minimal depression". For this study a numerical value of 14 or greater indicated a positive result with the BDI-II.

Project Timeline

Once approval was obtained by the DNP chair and team members on August 2, 2018 the study was submitted to Rutgers IRB for approval. Rutgers IRB approval was received September 26, 2018. The ARNG, Office of the Chief Surgeon reviewed this study and endorsed its scientific merit and verified that all military research requirements have been met on January 4, 2019. The Adjutant General of the New Jersey National Guard gave the final approval for the voluntary participation of NJARNG soldiers in this study in January 2019. Data collection took place from February through April, 2019 on drill weekends when the MED-DET was conducting PHAs. Data analysis, writing, revisions, results and conclusion were edited and complete by December 18, 2019. The entire study was presented and completed for December 18, 2019 and application for graduation was completed to graduate in January 2020.

Resources Needed

The BDI-II Q-global Starter Kit which included the BDI-II print manual, digital manual and 5 Q-global interpretive reports was purchased from Pearson Clinical for $96.00. Additionally, the BDI-II Q-global Scoring 1-year subscription which allowed for unlimited use of paper administration scoring reports for a single user was purchased from Pearson Clinical for $40.00.

Evaluation Plan

An analysis of the descriptive statistics was competed using Microsoft Excel. The demographics including marital status, age, sex, and military unit was calculated for the overall sample to identify the mean, median, and frequency. The mean and standard deviation was computed for each answer to look at the skewness of the sample. A paired t-test was used to compare the determined mean and standard deviation for the BDI-II and the PHQ-8. Cronbach's alpha determined the reliability in terms of internal consistency specifically for the ARNG population.

Data Maintenance & Security

All data was entered on a Dell laptop computer that required Common Access Card (CAC) access and personal password protection that was available only to the PI. This data was transferred to a password protected zip drive and stored with the master roster. Stored aggregate data and written consent forms were stored in the locked office of Dr. Melanie Percy at Rutgers University Newark, 65 Bergen Street, NJ 07107 in accordance with the regulations of the Office of Information Technology. Protected heath information (PHI) for this study that acted as an identifier was the PHA roster number, name, age, and unit. They were provided by the participant who was filling out the study packet. The master roster and zip drive was kept in a separate, secure cabinet in the locked office of the New Jersey State Surgeon located at the National Guard Training Center and MED-DET located at 35 Camp Drive, Sea Girt NJ 08750. The identifiers were deleted after the data entry process was complete. The de-identified data that is stored at Rutgers University will be destroyed in six years by the Chair of this DNP project. The PI is the only individual who has access to the PHA master roster, data, ad written

consent forms and tools. After reviewing for positive screenings, extra and incomplete questionnaires were shredded and discarded on site as per HIPAA regulations.

Findings

A total of 841 surveys were distributed over a five day period of data collection (N=841). The soldiers returned 136 (16.17%) surveys. Of the returned surveys 115 (85%) were complete.

Demographics

The current race/ethnic distribution of the ARNG included 56% White, 21% Black, 15% Hispanic, 6% Asian, and 2% of other races/ethnicities. A total of 41% were married; 81% were male; 34% were 25 years or younger, 19% were 26 to 30 years of age, 15% were 31 to 35 years old, 11% were 36 to 40 years of age, and 21% were over 41 years old. This distribution is similar to that of the Army's Active and Reserve components (Military One Source; The Office of Army Demographics, 2017). The sample demographics of the study are outlined in Table 1.

The distribution of male to female soldiers in the ARNG component was 83.1% male to 16.9% female (Military One Source; The Office of Army Demographics, 2017). With the nearly doubled female response rate it is possible that because the Principal Investigator was female a positive female gender bias was created, making female soldiers more comfortable in reporting. This would also support the under reporting of male respondents. However, prior research suggests that females have a tendency to display greater empathy and sense of emotional closeness which contribute to a higher survey response rate (Smith, 2008), which could explain the doubled female response rate.

Survey Statistics

Of the 115 surveys, the mean, standard deviation, and median scores for the PHQ-8 and BDI-II are resulted in Table 2. Pearson's correlation coefficient was used to assess for

correlation between the Beck's Depression Inventory II and the PHQ-8 depression screening tools and total depression score. There was a positive linear correlation between the two tools, r = 0.86, n = 115, p = 0.05.

Table 1
Demographics

Characteristics	N=115
Gender, n (%)	
Male	79 (68.6%)
Female	36 (31.3%)
Level of Education, n (%)	
High School	25 (21.7%)
Undergrad	74 (64.3%)
Graduate	13 (11.3%)
Trade School	3 (2.6%)
Employment, n (%)	
Unemployed	20 (17.3%)
Student	15 (13%)
Healthcare	11 (9.5%)
Military/Law Enforcement	26 (22.6%)
IT	5 (4.3%)
Business/Management	14 (12.1%)
Sales/Customer Service	19 (16.5%)
Legal/Education	5 (4.3%)
Marital Status n (%)	
Married	36 (31.3%)
Single	75 (65 %)
Divorced	4 (3.5%)

Table 2
Survey Statistics

Tool	n	Mean	SD	Median
PHQ-8	115	1.83	2.69	1
BDI	115	4.33	5.77	2

Note. SD=Standard Deviation. n=number of participants. N=230

A scatter plot summarizes the results (see Table 3). The coefficient of determination (r^2) was calculated to be 0.73 which shows good dependent variability. Overall, there was a good, positive correlation between Beck's Depression Inventory II and depression scores. The Cronbach's alpha of the completed Beck's Depression Inventory II was 0.91, (95% CI= 0.8657,

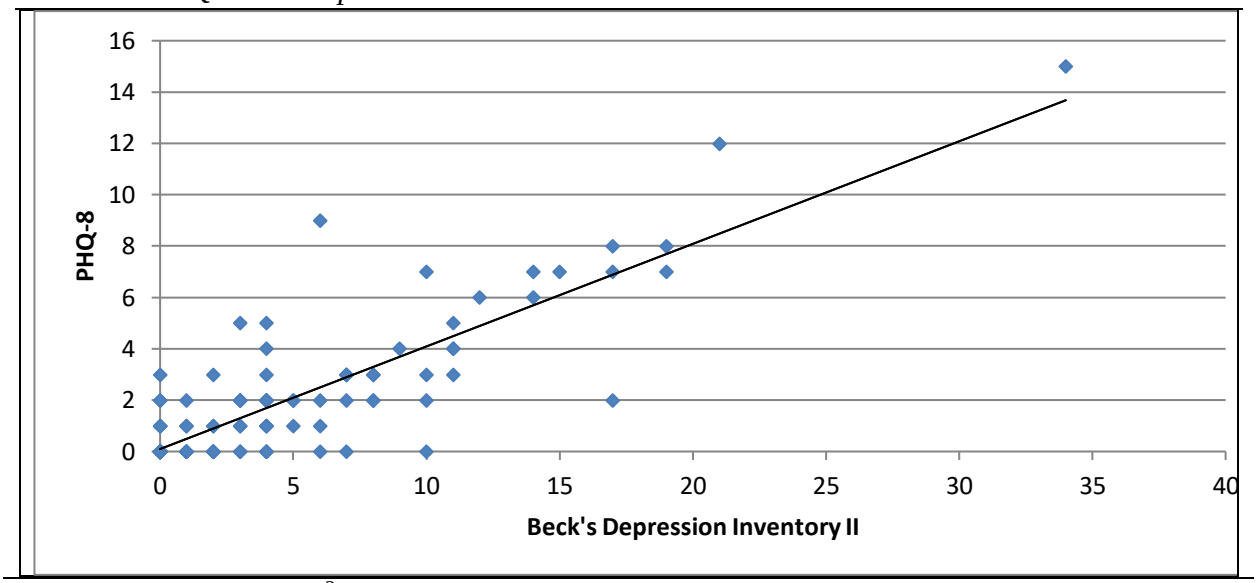
0.9337) which demonstrates that this instrument was internally consistent in an ARNG population, whereas the Cronbach's alpha of the PHQ-8 was 0.82, (95% CI=0.749, 0.8719).

Pearson's alpha score for both scales was acceptable but it's important to note that the internal consistency was lower for the PHQ-8 than the BDI-II. Prior studies noted similar findings and concluded that the internal consistency discrepancy was due to the smaller number of items in the PHQ-8 (Titov et al., 2011). Both the PHQ-8 and BDI-II demonstrated acceptable internal consistency. Consistent with other studies, the two measures were moderately correlated. Differences were observed between the measures in the level of agreement in the severity of banding at pre- and post-treatment and at follow-up, indicating that the BDI-II tended to rate more patients as severe compared with the PHQ-8. This may be an artifact of the cutoffs; however, it is an important consideration for treatment providers, because treatment decisions are often made on this basis. Studies conducted by Cameron et al. reported that the severity cut offs of the PHQ were designed for clinician simplicity, to remember and apply. This tool was designed for accuracy versus levels of severity and the BDI-II was structured to measure severity based off of the DSM diagnostic criteria for depression which includes level of severity (Cameron et al., 2011). Further studies are needed to assess the validity of both scales' endorsed severity cutoff bands.

In conclusion, both self-administered measures of depression have good psychometric properties. Pending the results of further studies, the attributes of the PHQ-8, of being shorter, freely available, and based on the diagnostic criteria for depression, may indicate an advantage over the BDI-II. The same number of positive results were identified from the screening tools but the level of severity was resulted differently. The BDI had 15 positive scores ranging from mild

to severe whereas the PHQ-8 had 15 results ranged from mild to moderately severe. The table comparing these results can be seen in Table 4.

Table 3
BDI-II vs PHQ-8 Scatterplot



Note. n=115, (r)=0.86, (r^2) =0.73

Table 4
PHQ-8 results vs. BDI-II results

PHQ-8				BDI-II			
Level	Score	N	%	Level	Score	N	%
None-minimal	0-4	100	87%	Normal "ups & downs"	0-10	100	87%
Mild	5-7	13	11.3%	Mild mood disturbances	11-16	8	7%
Moderate	10-14	1	0.87%	Borderline clinical	17-20	5	4.3%
Mod Severe	15-19	1	0.87%	Moderate	21-30	1	0.87%
Severe	20-27	0	0	Severe	31-40	1	0.87%

Relationships between demographics and depression scales

To determine if there was any correlation between the total score and each demographic a linear regression was run. No relationship was found between the positive scores for depression and demographic characteristics. These values indicate there was no dependent variability with

either screening tool, meaning there was no correlation between age, gender, occupation, marital status, or educational level and the total score.

Discussion

There is an alarming rise in suicides in the National Guard which has gone largely un-researched in comparison to research conducted within the active duty Army. This researcher had the ability, access to the population and the tools necessary to carry-out this research. She was able to identify specific trends and concerns within the sample population. Demographically, the ARNG is a very diverse force. However, there were no correlations between age, sex, occupation, or education and an increased prevalence of depression. This may be due to the low total numbers of depression found, and this study's sample size. This finding may not be representative of the entire population. Studies have found female veterans are more likely to screen positive for depression (Haskell et al., 2010) where male soldiers have an increased risk of suicide (LeardMann et al., 2013). More research is needed to determine if there are any patterns that can be found.

Depression is found in the literature as a significant predictor in suicide, however Bachmann (2018) notes, "Suicide is a worldwide phenomenon. The majority of suicides worldwide are related to psychiatric diseases. Among those, depression, substance use, and psychosis constitute the most relevant risk factors, but also anxiety, personality-, eating- and trauma-related disorders as well as organic mental disorders significantly add to unnatural causes of death compared to the general population". Individuals may not present as depressed, would test negative on all depression screening, and still commit suicide. All positive depression screenings must be taken seriously. Individuals who may be having a psychological crisis must

be further assessed, provided with a safe patient centered plan of action, and followed up with appropriate care and support.

It was hypothesized that there would be an increase in the number of positive BDI-II scores when compared to the PHQ-8 scores, but comparison of the results showed this was not true. There were the same number of positive results from both tests.

More significantly, 47% (n = 54) of the participants scored zero on the PHQ-8, whereas only 36.5% (n = 42) scored zero on the BDI. This illustrates the greater specificity of the BDI when detecting depression symptoms compared to the PHQ-8. This is a very important quality of the BDI-II. A more specific test will identify a larger percentage of participants who have various levels of depression. The BDI-II measures both somatic-effective and cognitive symptoms of depression. The cognitive symptoms of depression include sadness, past failures, guilty feelings, self-criticalness, worthlessness (Vanheule, Desmet, Groenvynck, Rosseel, & Fontaine, 2008). The PHQ-8 measures only somatic complaints of depression (Kroenke, Spitzer, Williams, & Lowe, 2010). The cognitive section of the BDI-II assesses the individual as a multi-faceted individual, while the PHQ-8 only references physical symptoms of depression. Smolderen et al. (2009) reported, “Among those patients with clinically recognized depression, prominent cognitive depressive symptoms (such as sadness, pessimism, and loss of interest) were more likely to facilitate the recognition of depression, while predominantly somatic symptoms (such as fatigue, loss of energy, and sleep difficulties) were not independently associated with depression recognition” (Smolderen et al, 2009). Furthermore, Titov et al. (2011) found, “the BDI-II categorized a greater proportion of participants with severe depression than the PHQ-8” (Titov et al., 2011). This supports that the cognitive, more subtle results make the BDI-II a more specific test in identifying severity levels of depression compared to the PHQ-8.

Hoge et al. (2004) reported that in the military, there are unique factors that contribute to resistance to seeking such help, particularly concern about how a soldier will be perceived by peers and by the leadership. Concern about stigma was disproportionately greatest among those most in need of help from mental health services. Soldiers and Marines whose responses were scored as positive for a mental disorder were twice as likely as those whose responses were scored as negative to show concern about being stigmatized and about other barriers to mental health care (Hoge et al., 2004). Studies conducted by Britt, Wright, & Moore (2012) identified that one of the main reasons soldiers do not seek mental health services is the stigma of asking for help. Soldiers perceived that seeking treatment would cause embarrassment, harm to their military career, and cause their peers to have decreased confidence in them (Britt et al., 2012). Due to these concerns, these soldiers are more likely to downplay their symptoms to avoid being stigmatized by their leadership.

There were a total of 15 positive responses on the BDI-II and PHQ-8. Eleven participants tested positive on both tools. The remaining 4 had positive scores on one tool but negative scores on the other. These positive outliers can be seen in Table 5. It is noted that the positive BDI-II score has a greater range from the PHQ-8 score versus the positive PHQ-8 score from the BDI-II. This could support that the BDI-II is more specific in assessing levels of depression. Further studies and a larger sample size is needed to substantiate these findings.

Table 5
Positive outliers

(+)BDI-II : (-)PHQ-8	BDI-II Score	PHQ-8 Score
	11	4
	17	2
	11	4
	11	3
(-)BDI-II : (+)PHQ-8		
	6	9
	10	7
	4	5
	3	5

In many surveys the participants provided conflicting responses to the same question when asked on the two different tools. For example, the PHQ-8 asked the participant to use a scale of 0-3 to rate the statements “Feeling tired or having little energy”. The BDI-II asked the participant to use a scale of 0-3 to rate the statement “Loss of energy.” The same participant would answer “0” on the PHQ-8 and “2” on the BDI. However, it is important to note that even with that discrepancy the numbers of positive depression were the same across tools. Due to the numerous amount of variables the reason for conflicting responses cannot be measured.

Table 6 outlines the number of conflicting responses when participants were asked identical questions on the depression screening tools.

Table 6
Conflicting responses

PHQ-8	BDI-II	Conflicting Response (%)
Little interest or pleasure in doing things.	Loss of pleasure	16 (13.9%)
Trouble falling or staying asleep, or sleeping too much.	Changes in sleeping pattern	36 (31.3%)
Poor appetite or overeating.	Changes in appetite	17 (14.7%)
Trouble concentrating on things, such as reading the newspaper or watching television.	Concentration Difficulty	17 (14.7%)

Limitations

A considerable limitation in this study was that the BDI-II and the PHQ-8 are self-reporting tools. The disadvantages of self-reporting tools include responder honesty, response bias, misinterpretation of questions, and consistency of responses. Response bias is a major limitation with self-reporting tools where the individual responds to a question in a certain way regardless of the question (Demetriou, Ozer, & Essaw, 2015).

In regard to this study's sample size limitations, a total of 814 surveys were distributed and only 13.67% (n = 115) were completed in their entirety. This low completion percentage limited the study. There are various possible explanations as to why this was the case, such as overall concern about leadership finding out and the negative impact that could come from peers and senior leadership (Meadows et al., 2018).

Recommendations

There are a number of recommendations that could be implemented to improve the mental health screening process in the NJARNG. First, self-reporting tools have limitations that can be overcome when a face to face assessment is added. Using interpersonal skills and communication during a face to face interview may increase feelings of support and cohesion,

motivating the soldier to disclose true feelings about stressors and depression. Without the face to face interaction the depression screening process may feel impersonal and the soldier is less likely to disclose feelings of psychological symptoms where support and interventions are needed (Newman et al., 2002). This technique can be individualized based on the needs of the soldier and the clinical findings found by the provider conducting the assessment.

As outlined by DoDI 6490.14, a qualified provider may be an independently licensed mental health care provider or a trained and certified health care provider such as a physician, physician assistant, nurse practitioner, advanced practice nurse, independent duty corpsman, special forces medical sergeant, independent duty medical technician, independent health services technician, or mental health technician who has completed the certification training developed by the Office of the Deputy Assistant Secretary of Defense Force Health Protection and Readiness and the Deployment Health Clinical Center (Carter, 2013). Being that these individuals are military personnel on orders to staff the PHA event, it will not accrue additional cost to facilitate face to face assessments.

Second, when conducting face to face assessment screenings the Medical Command could offer same sex screeners or ask the soldiers' participating if they have a preference for a male or female provider. Providing the Soldier's with this extra choice may could eliminate the potential for social desirability bias. The goal is that they feel comfortable enough to disclose honestly instead of masking feelings of depression and answering in a way that they feel is socially acceptable (Demetriou et al., 2015).

Implications

Economic

The BDI-II Q-global Starter Kit which includes the BDI-II print manual, digital manual and 5 Q-global interpretive reports when purchased from Pearson Clinical is $96.00. Additionally, the BDI-II Q-global Scoring 1-year subscription ($40.00) allows unlimited use of paper administration scoring reports for a single user. To mandate 10 providers and/or Nurses in the ARNG to administer the BDI-II will cost the state $400.00 per year. The Servicemembers' Group Life Insurance pays out $400,000 per death. The potential for early intervention to prevent a Guardsman suicide will result in a significant cost benefit to the state of New Jersey.

Quality & Safety

Although many tools are available to assess for depression, they must be appropriate for the population they are assessing. These screening tools are designed to identify at-risk individuals for depression and not diagnose them. However providers will sometimes use these tools as a "quick diagnosis." The ability to identify depression and negative thought processes may lead to early intervention and prevention of further depression development (Beck, Steer, Ball, & Ranieri, 1996; Beck, Steer, & Brown, 1996; Beck et al., 1961; Beck, 1997). Application of this knowledge to improve the mental health of ARNG soldiers will allow for a more comprehensive approach to their overall health and wellbeing when caring for our service members, ultimately conserving the fighting strength of ARNG soldiers. Depression is a complex phenomenon. It is the result of, and can lead to many other forms of adverse behaviors, such as suicidality.

Practice

The current mandated screening tool for depression is the PHQ-8. However, the New Jersey Adjutant General, Medical Command, and the New Jersey State Surgeon have authorization to improve the standard operating procedure including both BDI-II and the DoD approved PHQ-8 screening tool to satisfy all current regulations and potentially decrease the amount of suicide attempts and/or deaths within the NJARNG.

Conclusion

Using Cronbach's alpha, the BDI-II and PHQ-8 tools were compared to measure their effectiveness in the evaluation of depression in NJARNG soldiers. The BDI-II measures both somatic-effective and cognitive symptoms of depression. The cognitive symptoms of depression include sadness, past failures, guilty feelings, self-criticalness, worthlessness (Vanheule et al., 2008). The PHQ-8 measures only somatic complaints of depression (Kroenke et al., 2010). A larger study might demonstrate a more significant difference between these two tools, supporting a change in the standard of practice in the New Jersey National Guard. The unacceptably high rates of suicide and suicide attempts in the NJNG necessitates a change in the current clinical practice. The BDI-II presents depression as more than physical symptoms. This change in approach to depression may be critically important to identifying more people who are depressed but not showing classic physical symptoms. A more sensitive test has the potential to decrease the amount of suicide attempts and/or deaths among these soldiers. This identification can make the soldier's chain of command aware of potential risk factors and will allow them to offer supportive resources as needed to deescalate stressors contributing to depression. For these reasons, it is concluded that the Becks Depression Inventory should be used as an adjunct to the required PHQ-8 tool for identifying depression in a National Guard sample.

Completion of the annual PHA is mandatory as instructed by the United States Army Medical Command Operation Order (OPORD) 10-70. The current DoD mandated screening tool for depression is the PHQ-8. However, the New Jersey Adjutant General, Medical Command, and the New Jersey State Surgeon have authorization to revise and improve the standard operating procedure on how depression screenings are conducted. This new standard will include the BDI-II along with the DoD approved PHQ-8 screening tool to satisfy all current regulations and potentially decrease the amount of suicide attempts and/or deaths within the NJARNG.

Translation

The New Jersey National Guard prides itself on the "citizen soldier" who is a part time soldier and a full time civilian. This project was designed to translate beyond the military group and remain transparent along many various occupations, education levels, and marital statuses that make up the fighting force of the New Jersey National guard.

Dissemination

This study will be added to the literature on behavioral health tools. The NJARNG will review the results of this study to help define the difficulties inherent in their reliance on self-reported screening tools such as the BDI-II and PHQ-8. Findings will be disseminated to New Jersey ARNG Chief of Staff, Medical Command, and New Jersey State Surgeon. Completion of the annual PHA is mandatory as instructed by the United States Army Medical Command Operation Order (OPORD) 10-70 which includes the DoD mandated online PHQ-8. Once complete, the recommendation that the BDI-II will be added as an additional screening tool along with the PHQ-8 for annual PHAs in the state of New Jersey.

Professional Reporting

PowerPoint presentations are being scheduled to share the results among the ARNG Command and Medical units. Once the information is reported New Jersey, it has been requested to present this information at the National Guard Bureau in Arlington, VA and the North Carolina National Guard Medical Command.

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Appendix A

Table of Evidence

Is there a more appropriate depression screening tool that should be used when screening National Guard Soldiers for depression?

Article One	
Paper Section and Topic	Description
Title	Suicide in the U.S. army: stressor-strain hypothesis among deployed and non-deployed Army National Guard soldiers
Author and Date	James Griffith, 2015
Evidence Type	Unit Risk Inventory Survey, Qualitative Study
Sample	3 data sources: 1. 180 company size units 2. 50 company size units-Reintegration 3. All ARNG suicides for calendar years 2007 through 2012.
Sample Size	6,523 including the 523 suicides for the years 2007 through 2012 plus 1,000 non-suicide cases for each calendar year
Setting	Deployed soldiers, non-deployed soldiers, home station soldiers
Study findings that help answer the EBP Question	Prevalence of suicidal behaviors among soldiers was higher than among civilian populations. Risk was highest among home station than deployed soldiers
Limitations	Stressor-strain phenomenon, beneficial effects of cohesiveness at time of deployment, lack of response being that it is a survey. Survey funded by US Army Substance Abuse Program and unit leaders administer the survey to their soldiers
Evidence Level and Quality	Level III and Good Quality

Article Two	
Paper Section and Topic	Description
Title	Belonging Protects Against Post Deployment Depression in Military Personnel
Author and Date	Craig J. Bryan and Elizabeth A. Heron; 2015
Evidence Type	Self-Report survey, Qualitative Study
Sample	US Air Force airmen aged 18-45 years who were part of a 9-month combat convoy mission to Iraq
Sample Size	168
Setting	Participants were recruited from two detachments of active duty Air Force vehicle operators attending the Basic Convoy Course en route to a 9-month deployment in Iraq. Data was reassessed 1, 3, 6, and 12 months post deployment
Study findings that help answer the EBP Question	That sense of belongingness and unit cohesion may protect service members from depression from pre-deployment through deployment and post deployment adjustment
Limitations	Self-reporting survey, small sample size of 168 soldiers, predominantly male sample
Evidence Level and Quality	Level III and Good Quality

Article Three	
Paper Section and Topic	Description
Title	Factorial Validity of The Center for Epidemiological Studies-Depression (CES-D) Scale in Military Peacekeepers
Author and Date	Jennifer A. Boisvert, Donald R. McCreary, Kristi D. Wright, and Gordon J. G. Asmundson; 2003
Evidence Type	Anonymous health status questionnaires, Qualitative Study
Sample	Veterans from regular and reserve duty forces of the Canadian military
Sample Size	102 women and 102 men
Setting	Canada Veterans Affairs
Study findings that help answer the EBP Question	It established factorial validity of the Center for Epidemiological Studies Depression Scale in a military sample
Limitations	Self-reporting survey, insufficient sample size
Evidence Level and Quality	Level III and Good Quality

Article Four	
Paper Section and Topic	Description
Title	A comparison of the PRIME-MD PHQ-9 andPHQ-8 in a large military prospective study, the Millennium Cohort Study
Author and Date	Timothy S. Wells, Jamie L. Horton, Cynthia A. LeardMann, Isabel G. Jacobson, Edward J. Boyko, 2012
Evidence Type	Self-reported questionnaire, longitudinal cohort study
Sample	Current and former U.S. military personnel
Sample Size	143,705 Service Members
Setting	Not specified
Study findings that help answer the EBP Question	It was identified that it is not possible to screen positive for depression on the PHQ-8 and negative on the PHQ-9
Limitations	Scores from the PHQ-9 were extrapolated. This cohort may not fully represent the U.S. military although it is thought to be a well-represented sample. Included all branches and components which generalized the findings. Self-reported information
Evidence Level and Quality	Level III and Good Quality

Article Five	
Paper Section and Topic	Description
Title	On the Validity of the Beck Depression Inventory
Author and Date	Paul Richter, Joachim Werner, Andres Heerlein, Alfred Kraus, Heinrich Saur: 1998
Evidence Type	Meta-analyses of studies on the psychometric properties of BDI
Sample	Multiple based on meta-analysis
Sample Size	Multiple based on meta-analysis
Setting	Multiple based on meta-analysis
Study findings that help answer the EBP Question	Suggest that the Becks Depression Inventory has good psychometric properties, well documented by numerous empirical studies, and the high validity standards explains why this tool is used as the standard to validate other rating scales of depression
Limitations	Self-rating depression scale
Evidence Level and Quality	Level III and Good Quality

Article Six	
Paper Section and Topic	Description
Title	Suicide Risk Assessment and Prevention: A Systematic Review Focusing on Veterans
Author and Date	Heidi D. Nelson, Lauren M. Denneson, Allison R. Low, Brian W. Bauer, Maya O'Neil, Devan Kansagara, Alan R. Teo; 2017
Evidence Type	Systematic Review
Sample	Trials, observational studies, and systematic reviews relevant to U.S veterans and military personnel
Sample Size	19 Studies
Setting	Searches of MEDLINE, PsycINFO, SocINDEX and Cochran's databases from Jan 1, 2008 to September 11, 2015
Study findings that help answer the EBP Question	Risk assessment methods have been shown to be sensitive predictors of subsequent suicide and suicide attempts
Limitations	Overall low risk of suicide making it difficult to identify methods to identify suicide risk
Evidence Level and Quality	Level III and Good Quality

Article Seven	
Paper Section and Topic	Description
Title	The Associations Between Army National Guard Versus Active Duty Soldier Status and Perceived Burdensomeness, Thwarted Belongingness, and Acquired Capability
Author and Date	Matthew C. Podlogar, Claire Houtsma, Lauren R. Khazem, Fallon Ringer, Thomas Mofield, Bradley A. Green, Michael D. Anestis, Ingrid C. Lim, and Thomas E. Joiner; December 2017
Evidence Type	Multivariate analysis of covariance
Sample	Active duty Army and National Guard service members
Sample Size	Active Duty 1,393 and National Guard 623
Setting	Completed online self-report questionnaires via laptops in classroom environments which can hold 25 soldiers at a time
Study findings that help answer the EBP Question	Findings of this study support the view that National Guard and active duty soldiers differ on constructs which have been previously shown to be associated with suicidal ideation and attempts
Limitations	Self-reporting questionnaires, underrepresented sample of National Guard soldiers
Evidence Level and Quality	Level III and Good Quality

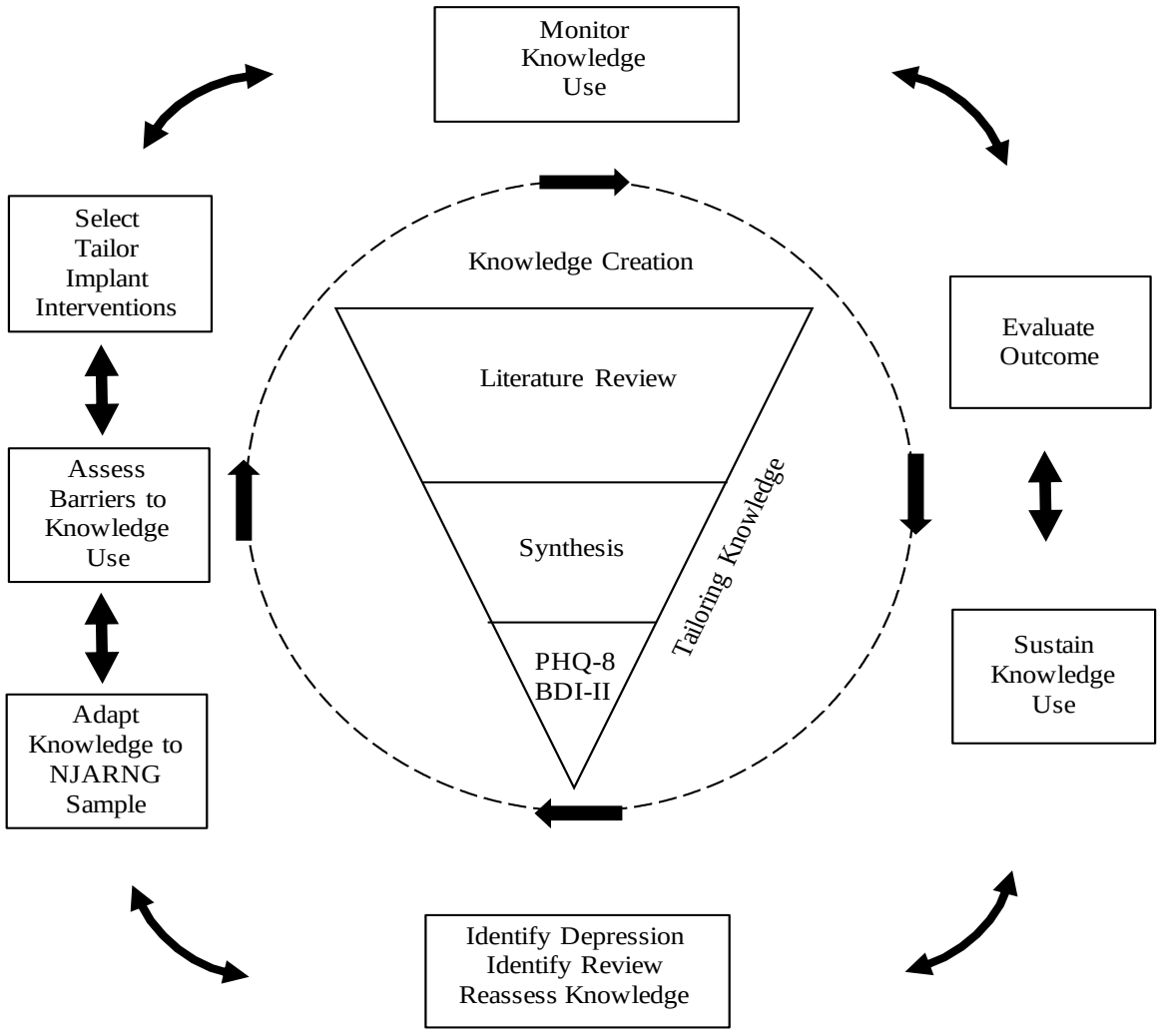
Article Eight	
Paper Section and Topic	Description
Title	Predictors of suicidal ideation among depressed veterans and the interpersonal theory of suicide
Author and Date	Paul N. Pfeiffer, Samantha Brandfon, Elizabeth Garcia, Sonia Duffy, Dara Ganoczy, H. Myra Kim, Marcia Valenstein; 2014
Evidence Type	Self-reported surveys, Qualitative Study
Sample	Patients of the Veterans Health Administration diagnosed with a depressive disorder
Sample Size	443 Veterans
Setting	Veterans Health Administration
Study findings that help answer the EBP Question	Hopelessness and burdensomeness appears to be an important factor in the development of passive suicidal ideation
Limitations	Self-reported survey, measurements of belongingness and burdensomeness only partially represents the construct described by the interpersonal theory of suicide
Evidence Level and Quality	Level III and Good Quality

Article Nine	
Paper Section and Topic	Description
Title	Understanding Risk and Protective Factors for Suicide: A Primer for Preventing Suicide
Author and Date	Suicide Prevention Resource Center, & Rodgers, P., 2011
Evidence Type	Guideline
Sample	N/A
Sample Size	N/A
Setting	N/A
Study findings that help answer the EBP Question	Provides an overview of important risk and protective factors as they relate to suicide
Limitations	Focused toward a civilian population, risk and protective factors are not universal across the populations
Evidence Level and Quality	Level IV and High Quality

Article Ten	
Paper Section and Topic	Description
Title	Operation Order 10-70 (USAMEDCOM Comprehensive Behavioral Health System of Care Campaign Plan)
Author and Date	Point of contact for this document is Lieutenant Colonel Edward A. Brusher, March 2011
Evidence Type	Guideline
Sample	N/A
Sample Size	N/A
Setting	N/A
Study findings that help answer the EBP Question	This is the newest guideline that drives the military health assessment process and includes the current mental health screening tool
Limitations	Multiple guidelines and changes (Fragos) within a guideline
Evidence Level and Quality	Level IV and High Quality

Appendix B

Knowledge-to-Action Framework



Action Circle

Adapted from (Graham et al., 2006)

Appendix C

Morning Briefing Script

Good morning. Today, some of you will be asked to participate in a voluntary research study which is being conducted by me as part of the requirements for my Doctor of Nursing Practice degree at Rutgers University, School of Nursing. My name is Melinda Moyer and I am the principal investigator for this study. The primary purpose of this study is to determine if there is a more appropriate tool to screen our National Guard soldiers for depression. Individuals that are present for today's PHA will be selected on a random basis for participation. When you receive your PHA folder at check in some of you may find a Rutgers University consent form inside. If you are interested in participating please read the consent form in its entirety. If at that time you are still wishing to participate, please sign the agreement to participate block on page 3. Then, complete the attached form titled "Becks Depression Inventory" and complete the other screening form titled "Patient Health Questioner" also found within your PHA folder.

These forms can be completed at any time throughout the day prior to your PHA check out and should take no more than 15 minutes to complete both questionnaires. There will be specialty marked, secure, Rutgers drop boxes placed throughout the building. Upon completion of these forms please drop them in any of these assigned boxes. It is not expected that any part of your PHA process will be delayed due to your participation in this study. If you have agreed to participate in this research your responses will be reviewed and logged for data collection purposes. If you have chosen to not participate forms will not be collected or reviewed. No

information will be obtained for study purposes from forms that were not found in the Rutgers drop boxes.

Please be aware that participation in this research study is voluntary. Deciding not to participate will not change your relationship with the healthcare providers. However, completion of your annual PHA is mandatory as instructed by the United States Army Medical Command Operation Order (OPORD) 10-70. This study has been approved by the Rutgers Institutional Review Board, National Guard Bureau, Army Human Protections Office, and the New Jersey Adjutant General. This research has an IRB appointed ombudsman who is unassociated to the research and will be present during the recruitment to monitor that voluntary participation is clearly and adequately stressed and that information provided about the research is clear, adequate, and accurate. If anyone has any questions at any time I will make myself available to answer any questions or concerns. My contact number is 732-814-7764. Thank you.

Appendix D

Rutgers Adult Consent Form

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CONSENT TO TAKE PART IN A RESEARCH STUDY

TITLE OF STUDY: Comparison of PHQ-8 and Beck Depression Inventory II in the Army National Guard

Principal Investigator: Major Melinda Moyer MSN, FNP-BC, CCRN, FN-CSA

This informed consent form provides information about a research study and what will be asked of you if you choose to take part in it. If you have any questions now or during the study, if you choose to take part in it, you should feel free to ask them and should expect to be given answers you completely understand. It is your choice whether to take part in the research. Your alternative to taking part is not to take part in the research. Superiors will not influence the decisions of their subordinates regarding participation in this research project.

After all of your questions have been answered and you wish to take part in the research study, you will be asked to sign this informed consent form. You are not giving up any of your legal rights by agreeing to take part in this research or by signing this consent form. You are encouraged to ask any questions at any time during the study.

Who is conducting this research study?

Major Melinda Moyer MSN, FNP-BC, CCRN, FN-CSA is the Principal Investigator (PI) of this research study. The PI has the overall responsibility for the conduct of the research. However, there are often other individuals who are part of the research team.

Melinda Moyer may be reached at 732-814-7764; 65 Bergen Street, Newark, NJ 07107. She may be contacted by phone at any time if any questions now or during the study arise.

Melinda Moyer or another member of the study team will also ask you to sign this informed consent. You will be given a copy of the signed consent form to keep.

Why is this study being done?

The primary purpose of this study is to determine if the BDI-II is a more appropriate tool to screen our National Guard soldiers for depression versus the PHQ-8 that is currently in use.

Who may take part in this study and who may not?

Any Army National Guard soldier who is here for their annual periodic health assessment (PHA) may participate in this study. Soldiers who do not sign this consent form may not participate in this study.

Why have I been asked to take part in this study?

You have been asked to take part in this study because you are an Army National Guard soldier and you are here to complete your annual PHA.

How long will the study take and how many subjects will take part?

This study will take place over 3 drill weekends. A total of 1000 soldiers will screened, 500 soldiers will be the sample size selected to participate in this study. Participation in this study should not interfere with the amount of time it takes to complete the PHA process. These forms can be completed at any time throughout the day prior to PHA check out and should take no more than 15 minutes to complete both questionnaires.

What am I being asked to do?

You will be asked to read and sign this consent form and then complete the written Patient Health Questioner and the Becks Depression Inventory-II. Completion of your annual PHA is

mandatory as instructed by the United States Army Medical Command Operation Order (OPORD) 10-70 which includes the online PHQ-8. Only the paper form of the PHQ-8 is voluntary for completion and data collection. These forms can be completed at any time throughout the day prior to PHA check out and should take no more than 15 minutes to complete both questionnaires. At any time throughout the PHA, you can return the completed study packet in one of the specialty marked, locked, Rutgers drop boxes that will be placed throughout the building. Only the PI will have access to these drop boxes and documents. Any positive screenings from either the BDI-II or PHQ-8 will be reported to the chain of command for mental health referral and evaluation. A positive BDI-II, even if there is no positive screening on the PHQ-8 will be reported to the chain of command for additional mental health referral and evaluation.

What are the risks and/or discomforts I might experience if I take part in this study?

No risks or discomforts greater than those in usual life are expected from participation in this study. However, sometimes filling out these forms can make people feel anxious, upset, or recognize that they are depressed. If these feelings happen to you, please notify your chain of command or a member of the Medical Detachment immediately. If you have any of those feeling or feel distressed after you go home you must call your change of command so that we may provide immediate assistance to you. Although every precaution will be taken to keep your information confidential it is possible that there could be a breach of confidentiality. Any positive screenings from either the BDI-II or PHQ-8 will be reported to the chain of command for mental health referral and evaluation. A positive BDI-II, even if there is no positive screening on the PHQ-8 will be reported to the chain of command for additional mental health referral and evaluation.

Are there any benefits to me if I choose to take part in this study?

You will not receive any direct benefit for participation in this study. However, the knowledge gained from this study may be used in further research to improve the behavioral health of National Guard service members.

What are my alternatives if I do not want to take part in this study?

Your alternative is to not take part in this study. Deciding not to participate will not change your relationship with the healthcare providers. You will not lose any benefit that you are normally entitled to.

Will there be any cost to me to take part in this study?

There will be no cost to you to take part in this study

Will I be paid to take part in this study?

You will not be paid to take part in this study.

How will information about me be kept private or confidential?

All efforts will be made to keep your personal information in your research record confidential, but total confidentiality cannot be guaranteed. If your responses indicate that you are depressed an additional screening by a certified mental health worker will be completed. All results will be retained by the PI on an encrypted flash drive which will be kept in a locked cabinet in a locked cabinet in the locked office of the PI's chair, Dr. Melanie Percy at Rutgers University School of Nursing, 65 Bergen Street, Newark NJ room 1137. Only the PI and her study team will have access to this information. Any identifiable research information such as the master roster with names and assigned PHA roster numbers will be kept in a locked cabinet of the New Jersey Medical Commanders office located at the National Guard Training Center and Medical Detachment located at 35 Camp Drive, Sea Girt NJ 08750.

What will happen if I do not wish to take part in the study or if I later decide not to stay in the study?

It is your choice whether to take part in this study. You may choose to take part, not to take part or you may change your mind and withdraw from the study at any time by contacting Melinda Moyer at 732-814-7764. If you do not want to enter the study or decide to stop taking part, your relationship with the study staff will not change, and you may do so without penalty and without loss of benefits to which you are otherwise entitled. Superiors will not be present at the time of recruitment and consent.

Who can I call if I have questions?

If you have questions about taking part in this study, you can call the principal investigator Melinda Moyer at 732-814-7764.

If you have questions about your rights as a research subject, you can call the IRB Director at Newark Health Sciences 973-972-3808 or the Rutgers Human Subjects Protection Program at 973-972-1149 in Newark.

AGREEMENT TO PARTICIPATE

1. Subject consent:

I have read this entire consent form, or it has been read to me, and I believe that I understand what has been discussed. All of my questions about this form and this study have been answered. I agree to take part in this study.

Subject Name:_____

Subject Signature:_____ Date:_____

2. Signature of Investigator/Individual Obtaining Consent:

To the best of my ability, I have explained and discussed all the important details about the study including all of the information contained in this consent form.

Investigator/Person Obtaining Consent (printed name):_____

Signature:_____ Date: _____

PLEASE PLACE IN RUTGERS DROP BOX

Appendix E

Periodic Health Questioner (PHQ-8)

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Over the **last 2 weeks**, how often have you been bothered by any of the following problems?
*(circle **one** number on each line)*

How often during the past 2 weeks were you bothered by...	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
6. 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

Appendix F

Beck Depression Inventory II (BDI-II)

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V 0477

Beck Depression Inventory

CRTN: ____ CRF number: ____

Page 14

Baseline

patient inits: ____

BDI-II

Date:

Name: _____ Marital Status: _____ Age: _____ Sex: _____

Occupation: _____ Education: _____

Instructions: This questionnaire consists of 21 groups of statements. Please read each group of statements carefully, and then pick out the **one statement** in each group that best describes the way you have been feeling during the **past two weeks, including today**. Circle the number beside the statement you have picked. If several statements in the group seem to apply equally well, circle the highest number for that group. Be sure that you do not choose more than one statement for any group, including Item 16 (Changes in Sleeping Pattern) or Item 18 (Changes in Appetite).

1. Sadness
- 0 I do not feel sad.
- 1 I feel sad much of the time.
- 2 I am sad all the time.
- 3 I am so sad or unhappy that I can't stand it.

2. Pessimism
- 0 I am not discouraged about my future.
- 1 I feel more discouraged about my future than I used to be.
- 2 I do not expect things to work out for me.
- 3 I feel my future is hopeless and will only get worse.

3. Past Failure
- 0 I do not feel like a failure.
- 1 I have failed more than I should have.
- 2 As I look back, I see a lot of failures.
- 3 I feel I am a total failure as a person.

4. Loss of Pleasure
- 0 I get as much pleasure as I ever did from the things I enjoy.
- 1 I don't enjoy things as much as I used to.
- 2 I get very little pleasure from the things I used to enjoy.
- 3 I can't get any pleasure from the things I used to enjoy.

5. Guilty Feelings
- 0 I don't feel particularly guilty.
- 1 I feel guilty over many things I have done or should have done.
- 2 I feel quite guilty most of the time.
- 3 I feel guilty all of the time.

6. Punishment Feelings
- 0 I don't feel I am being punished.
- 1 I feel I may be punished.
- 2 I expect to be punished.
- 3 I feel I am being punished.

7. Self-Dislike
- 0 I feel the same about myself as ever.
- 1 I have lost confidence in myself.
- 2 I am disappointed in myself.
- 3 I dislike myself.

8. Self-Criticalness
- 0 I don't criticize or blame myself more than usual.
- 1 I am more critical of myself than I used to be.
- 2 I criticize myself for all of my faults.
- 3 I blame myself for everything bad that happens.

9. Suicidal Thoughts or Wishes
- 0 I don't have any thoughts of killing myself.
- 1 I have thoughts of killing myself, but I would not carry them out.
- 2 I would like to kill myself.
- 3 I would kill myself if I had the chance.

10. Crying
- 0 I don't cry anymore than I used to.
- 1 I cry more than I used to.
- 2 I cry over every little thing.
- 3 I feel like crying, but I can't.

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Subtotal Page 1

Continued on Back

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Roche

V 0477

Beck Depression Inventory

CRTN: _____ CRF number: _____

Page 15

Baseline

patient inits: _____

11. Agitation

0 I am no more restless or wound up than usual.
1 I feel more restless or wound up than usual.
2 I am so restless or agitated that it's hard to stay still.
3 I am so restless or agitated that I have to keep moving or doing something.

12. Loss of Interest

0 I have not lost interest in other people or activities.
1 I am less interested in other people or things than before.
2 I have lost most of my interest in other people or things.
3 It's hard to get interested in anything.

13. Indecisiveness

0 I make decisions about as well as ever.
1 I find it more difficult to make decisions than usual.
2 I have much greater difficulty in making decisions than I used to.
3 I have trouble making any decisions.

14. Worthlessness

0 I do not feel I am worthless.
1 I don't consider myself as worthwhile and useful as I used to.
2 I feel more worthless as compared to other people.
3 I feel utterly worthless.

15. Loss of Energy

0 I have as much energy as ever.
1 I have less energy than I used to have.
2 I don't have enough energy to do very much.
3 I don't have enough energy to do anything.

16. Changes in Sleeping Pattern

0 I have not experienced any change in my sleeping pattern.
1a I sleep somewhat more than usual.
1b I sleep somewhat less than usual.
2a I sleep a lot more than usual.
2b I sleep a lot less than usual.
3a I sleep most of the day.
3b I wake up 1–2 hours early and can't get back to sleep.

17. Irritability

0 I am no more irritable than usual.
1 I am more irritable than usual.
2 I am much more irritable than usual.
3 I am irritable all the time.

18. Changes in Appetite

0 I have not experienced any change in my appetite.
1a My appetite is somewhat less than usual.
1b My appetite is somewhat greater than usual.
2a My appetite is much less than before.
2b My appetite is much greater than usual.
3a I have no appetite at all.
3b I crave food all the time.

19. Concentration Difficulty

0 I can concentrate as well as ever.
1 I can't concentrate as well as usual.
2 It's hard to keep my mind on anything for very long.
3 I find I can't concentrate on anything.

20. Tiredness or Fatigue

0 I am no more tired or fatigued than usual.
1 I get more tired or fatigued more easily than usual.
2 I am too tired or fatigued to do a lot of the things I used to do.
3 I am too tired or fatigued to do most of the things I used to do.

21. Loss of Interest in Sex

0 I have not noticed any recent change in my interest in sex.
1 I am less interested in sex than I used to be.
2 I am much less interested in sex now.
3 I have lost interest in sex completely.

3 4 5 6 7 8 9 10 11 12 A B C D E

Subtotal Page 2

Subtotal Page 1

Total Score

NR15645