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Combat Experiences and Post-Deployment Adjustment

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Combat Experiences and Post-Deployment Adjustment

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Dissertation

Presented to the Faculty of the Graduate School of

The University of Texas at Austin

in Partial Fulfillment

of the Requirements

for the Degree of

Doctor of Philosophy

The University of Texas at Austin

December 2019

Abstract

Combat Experiences and Post-Deployment Adjustment

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The University of Texas at Austin, 2019

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Abstract: The United States of America has been a nation constantly at war for almost two decades. This has resulted in military families being separated from their service member for significant periods of time due combat deployments, which can potentially have a negative impact on the family system. During deployments, service members can be exposed to various combat experiences, which research has linked to symptoms of posttraumatic stress, depression, and problematic alcohol use that develop post deployment. It is estimated that approximately 20% of soldiers in combat units return home with symptoms of behavioral health problems or develop these symptoms within three to six months following the deployment. Family reintegration can negatively be impacted when service members return home from a combat deployment and/or experience behavioral health concerns. By contrast, research has also indicated that healthy social supports, such as families and friends, can mitigate the development and/or aid the recovery of behavioral health concerns. This study investigates the relationship between combat exposure and marriage quality, and their impact on the behavioral health outcomes reported immediately following the deployment and four months post deployment. Additionally, utilizing the lens of the family system theory, the study examines the moderating effect that marriage quality has on the relationship between combat exposure and reported behavioral health symptoms. This study was

a secondary data analysis using Hierarchical Multiple Regression. Both combat exposure and marriage quality were found to influence the development of behavioral health outcomes. In this study, marriage quality did not moderate the relationship between combat exposure and reported behavioral health symptoms.

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Chapter 1

INTRODUCTION

For nearly two decades, service members in all branches of the military have been either training for deployment, deployed in a combat environment, involved in supporting operations, or recovering from a deployment. It has been estimated that over two million military personnel have been deployed to Iraq or Afghanistan as part of Operation Enduring Freedom (OEF), Operation Iraqi Freedom (OIF), or Operation New Dawn (OND) (Esposito-Smythers et al., 2011; O'Donnell, Begg, Lipson, & Elvander, 2011; Paley, Lester, & Mogil, 2013; Spelman, Hunt, Seal, & Burgo-Black, 2012). Families comprise a significant portion of the military community, which includes a large percentage of married households (over 50%) and two million children (O'Donnell et al., 2011; Paley et al., 2013). Service members and their families require resilience to successfully navigate the stresses, demands, and obligations of military life. Without a strong and reliable support network—including a quality marriage—service members may find it tremendously difficult to undergo deployment and post-deployment reintegration.

POST-DEPLOYMENT MENTAL HEALTH CONCERNS

Most service members are able to successfully return home from deployment and to readjust to their lives without difficulty. Others, however, are not so fortunate. In post-deployment surveys, up to 19% of service members experienced increasing problems with mental health, substance use, and relationships (Paul D. Bliese, Wright, Adler, Thomas, & Hoge, 2007; Cigrang et al., 2014; Hoge, Auchterlonie, & Milliken, 2006; Milliken, Auchterlonie, & Hoge, 2007). Additionally, between three and six months following deployment, nearly 30% of service members

suffered from mental health concerns (Adler, Bliese, McGurk, Hoge, & Castro, 2009). Studies have estimated that one in five service members are diagnosed with Posttraumatic Stress Disorder (PTSD), which is the most common of these mental health disorders (Dekel & Monson, 2010; Hoge et al., 2006; Richardson, Frueh, & Acierno, 2010), followed by depression (18%), substance use disorder (8%), and alcohol use disorder (7%) (Schultz, Glickman, & Eisen, 2014). Khaylis, Polusny, Erbes, Gewirtz, and Rath (2011) reported that PTSD is the most common diagnosis for service members who seek medical care at Veterans Health Administration (VHA) medical facilities following their separation from service. Combat exposure is a primary contributor to the development of mental health or substance use concerns following deployment. Post-deployment alcohol-related problems are linked to the presence of PTSD symptoms and to significant combat exposure (Cigrang et al., 2014). Increased rates of alcohol-related problems, including increased consumption and binge drinking, were noted in a population-based longitudinal study of US soldiers deployed to Iraq (Milliken et al., 2007; Wright, Foran, Wood, Eckford, & McGurk, 2012).

IMPACT OF POST-DEPLOYMENT IMPAIRMENT ON FAMILIES

Mental health problems such as PTSD have the potential to interfere with a family's ability to successfully reintegrate after deployment. Potential forms of family disruption include strained partner relationships, diminished parent-child relationships, and increased anger in the home (Batten et al., 2009; Khaylis et al., 2011; Ray & Vanstone, 2009). Research has indicated that there exists a well-established link between PTSD and distress that occurs in service members' relationships with their partners and families (Campbell & Renshaw, 2012; Roy & Skidmore, 2012). For example, the more significant the PTSD symptoms experienced by the service member,

the greater the distress experienced by his or her spouse (Dekel & Monson, 2010; Herzog, Everson, & Whitworth, 2011). Spouses of service members with deployment-related mental health concerns, compared to those without such concerns, tend to have higher rates of somatic complaints and emotional distress; these include increased headaches, difficulty breathing, and depression. PTSD in service members has also been linked to significant problems in their children, such as learning disabilities, social problems, and acting out (Dinshtein, Dekel, & Polliack, 2011), who may be subjected to increased violence as well as physical and emotional abuse; these children may also experience emotional detachment from their military parent and develop increased behavior problems (Basham, 2007). If not properly treated, post-deployment mental health impairment related to combat deployments can negatively impact the well-being and functioning of both the service member and their family.

FAMILY SUPPORT AS A PROTECTIVE FACTOR

An estimated 20% of service members return home from a combat deployment with mental health concerns. Conversely, 80% of such service members successfully reintegrate without any problem. One potential reason for successful reintegration may result from the availability of a social support network (family, friends, co-workers, and society), which may have a direct impact on and serve as a buffer against the development of (or recovery from) mental health problems (Greenberg et al., 2009; Welsh, Olson, Perkins, Travis, & Ormsby, 2015). Reupert, Maybery, Cox, and Scott Stokes (2015) conducted a systematic review of 31 articles, all devoted to family involvement during patient's recovery from mental illness, concluded that the potential to contribute to or to interfere with recovery depends upon the interactions between

family members and the roles that they play. This review made a number of salient points: that recovery from mental illness is positively impacted by the presence of meaningful family relationships, that these relationships promote a sense of personal identity and hope, that this leads to the acceptance of the mentally ill family member as "another person," and that, under such circumstances, recovery is expected (Reupert et al., 2015). Similarly, Aldersey and Whitley (2015) concluded that family can be an important variable in recovery by providing moral and practical support to the mentally ill family member, who then develops motivation to recover from severe mental illness. Additionally, the authors noted that an individual's recovery from mental illness can positively impact their family by decreasing stress in the family and alleviating the burden of caregiving. Furthermore, the recovering individual now has an increasing ability to contribute to the overall well-being of family life (Aldersey & Whitley, 2015).

Family members also influence post-deployment adjustment, either by contributing to (or compromising) healthy reintegration and mental health recovery. One study found that divorce or separation at twelve months post-deployment was predicted by marital quality at six months post-deployment, with marital quality being tied to PTSD, depression, and alcohol misuse (Cigrang et al., 2014). Lower levels of traumatic stress and symptoms of depression were noted in OIF and OEF service members who had high levels of resiliency and post-deployment social support, which included support from families (Pietrzak, Johnson, Goldstein, Malley, & Southwick, 2009). Another study conducted a post-hoc analysis and determined that intimate social supports may have a greater impact on PTSD symptoms than community and workplace social supports (Han et al., 2014). Welsh et al. (2015) studied more than 63,000 United States Air Force personnel and how natural support systems (intimate partners, leadership, and neighbors) functions as buffers to

a negative deployment experience. They noted fewer symptoms of depression in those service members who perceived high levels of support from intimate partners (Welsh et al., 2015). Family support is an important but understudied part of the social support network, but support from family may act as a protective factor against mental health problems.

PURPOSE OF THE STUDY

The purpose of this study was to add to the literature that examines the role of combat exposure and social support networks—specifically marriage quality—in the development of mental health problems or the support of healthy adjustments for combat-exposed service members. To this end, this study examined how combat exposure and perceived marriage quality influence the post-deployment adjustment of service members who reported mental health symptoms following a year-long combat deployment. In this study, perceived marriage quality was conceptualized in terms of the perceived quality of the relationship (having a good marriage, having a stable relationship, being happy with one's spouse, and feeling part of a team). The mental health symptoms and outcomes of particular interest for this study measured posttraumatic stress symptoms, depressive symptoms, and alcohol use problems reported by service members at two points in time (one week and four months post-deployment) during the year following their deployment.

This study conducted a secondary data analysis of a previous study, in which early post-deployment interventions were examined to determine their benefits to post-deployment adjustment and the stigma of seeking mental health treatment (Adler et al., 2009). Adler et al. (2009) conducted surveys to collect data from active duty service members from a Brigade Combat Team (BCT) that had returned from a yearlong combat deployment to Iraq. The data were collected

at three points in time (one week, four months, and 12 months post-deployment) between 2005 and 2006 (Adler et al., 2009; Adler et al., 2008; Hoge et al., 2004).

HYPOTHESES

The hypotheses for this study are: 1) service members who experience greater combat exposure will report more significant behavioral health symptoms following their combat deployment as compared to service members who report fewer combat experiences; 2) service members who perceive their marriage quality as more positive or supportive will report fewer behavioral health symptoms; and 3) marriage quality will moderate the relationship between combat exposure and reported behavioral health symptoms such that positive or supportive marriage quality will lessen the impact of combat exposure on subsequent behavioral health.

INTEREST IN THE PROBLEM

I have a specific interest in this topic as an active duty social worker who has provided support to this at-risk population in all social work practice categories within the Army Military Health System. I have provided clinical treatment to service members, with a focus on addressing the dysfunctional behaviors and symptoms believed to be triggered by combat deployments. In my practice, I have often observed that any decrease in a service member's level of functioning can be exacerbated if the family is not providing support toward recovery. Additionally, at the administrative level, I supported the development and implementation of services and treatment programs to meet the clinical needs of this at-risk population. A core belief of social workers is that the solutions to problems should be sought from a holistic—or systems—perspective. In order

to apply this core belief to the treatment and support of service members, the present study examines the role that perceived family support plays in service members' adjustment and well-being following combat deployment.

PLAN FOR CHAPTERS

This dissertation is organized into five chapters. Chapter 1 will introduce the problems faced by many service members and military families following combat deployments and will show the significance of family support to post-deployment adjustment as combat exposure and family support relate to mental health functioning. Additionally, this chapter will describe the study's purpose and will state the proposed hypotheses. In the context of both the military and populations at risk for developing mental health problems, Chapter 2 will delineate the family systems theory (FST), which functions as the present study's theoretical framework. The second chapter will also review the literature that examines the impact of combat deployments on service members and military families and will establish the importance of family support for mitigating negative post-deployment adjustment related to mental health functioning. Chapter 3 will describe the present study's methodology and design, sample population, survey instruments, and analysis plan. The next chapter, Chapter 4, will discuss the results and findings of the present study. The final chapter will present an interpretation of the present study's findings, including its limitations and its implications for social work policy, practice, and education, with a focus on the military population. A discussion of the considerations for areas of future research concludes the chapter.

Chapter 2

THEORETICAL METHODOLOGY AND LITERATURE REVIEW

This chapter will provide an overview of the theoretical framework for the present study and a summary of the literature relevant to the study's variables. The theoretical framework of this study will be based on the family systems theory, which will be employed to investigate how family systems prevent the development of mental illness and support post-deployment adjustment. Finally, the discussion will also address how combat exposure and deployment-related mental health problems impact the post-deployment adjustment of both service members and military families.

SOCIAL SUPPORT AND MENTAL HEALTH RECOVERY

Studies have recognized the importance of social support in buffering against or aiding recovery from mental illness determining that individuals who either have a greater number of supports or are more satisfied with their support network report a better quality of life (Bengtsson-Tops & Hansson, 2001; Corrigan & Phelan, 2004; Hansson et al., 2002; Rudnick & Kravetz, 2001). Corrigan and Phelan (2004) studied how the quantity and the quality of the overall support network influence the process of recovery, discovering that social support does not specifically translate to the remission of symptoms; rather, social support contributes to recovery, which was defined by an increase in hope and an improvement in focus on future goals and success for mentally ill individuals. Importantly, better recovery was noted by those individuals whose support network consisted of a greater number of friends and health care professionals relative to family members. Nonetheless, it was noted that the quality of family members in one's support network was strongly

associated with greater satisfaction compared to the amount of friends and health care professionals in the network (Corrigan & Phelan, 2004). This latter finding is consistent with the findings of a longitudinal study of patients being treated for major depression, which found that the quality of social support is more important than the quantity, regardless of the makeup of the social supports (Skarsater, Langius, Agren, Haggstrom, & Dencker, 2005). It is important to note that natural supports—consisting of friends, family, and neighbors—of one's recovery may complement professional supports. A cross-sectional study of male outpatients (N = 531) concluded that individuals with severe mental illness, who reported a high number of natural support contacts, reported greater professional support contacts; the opposite held true, demonstrating that the two supports systems complement each other rather than replacing one or the other (Tsai, Desai, & Rosenheck, 2012). Building on previous research, a qualitative study of 30 individuals in care following their first episode of psychosis found that social support networks are beneficial and contribute to recovery. This study concluded that positive intimate supports, professional supports, and friendships with others with and without mental illness significantly influence recovery. Additionally, positive social supports served as a buffer from the harmful effects of the stigma, which has often been found to be a prominent factor that interferes with recovery (Windell & Norman, 2013).

Furthermore, studies have been conducted that focus specifically on the role of family in recovery from severe mental illness. Aldersey and Whitley (2015) provide a summary of studies where research demonstrates a positive impact on recovery through family support in terms of instrumental help (i.e., logistical support, funds), practical support (i.e., taking on responsibilities), and intangible and emotional support. A study of 54 individuals with severe mental illness

concluded that family support can both contribute toward recovery and impede recovery. This study determined that family members, if they act appropriately, can support recovery through moral support and be a motivation toward recovery. This study also found that many of the participants appreciated their family being involved in their lives and that this contributed toward their recovery.

Conversely, it has also been determined that families—through criticism, hostility, or emotional over-involvement—can interfere with recovery by increasing stress levels. Having assessed the manner and level of support needed to facilitate recovery, these findings emphasized the importance of interventions for this population, which considers family as a type of support (Aldersey & Whitley, 2015). Another study was conducted on participants who utilized community-based mental health programs (N = 169) as part of their treatment for an affective disorder, schizophrenia, or other related disorders. This study observed the importance of quality, as opposed to quantity, of social support on the individual's positive attitude toward recovery (Pernice-Duca, 2010). The social support network, both formal and informal, has been studied in a variety of populations, all of them demonstrating that the network positively impacts recovery from and buffering against mental illness.

Social support networks that function as a protective factor or buffer against mental health symptoms have also been studied in the military population. Several studies observe the inverse relation between PTSD symptoms and social support for veterans from Vietnam, OIF, and OEF (Han et al., 2014; Pietrzak et al., 2009; Welsh et al., 2015). Most studies utilized cross-sectional designs. However, Han et al. (2014) conducted a longitudinal study of active duty and National Guard service members (N = 748), which both supported previous findings and provided a greater

understanding of how the positive social support of the unit during deployment may serve as a buffer against the development of PTSD symptoms following deployment. Additionally, informal supports, such as family and friends, can positively impact a service member's ability to cope with combat experiences. A study of military peacekeepers produced similar findings regarding the benefits of informal social supports. In a retrospective cohort study, Greenberg et al. (2009) determined that military peacekeepers utilize both social supports (consisting of friends and family) and professional supports (such as chains of command and medical professionals); furthermore, the authors observed that women preferred to discuss their deployment experiences with family members who were not their spouse, whereas men were more reliant on their spouses. As such, in both military and non-military populations, there is evidence that social support networks—including family support systems—can buffer against the development of mental illness and/or support healthy adjustment.

FAMILY SYSTEMS THEORY

Reintegration following deployment can be one of the most difficult stages of the deployment cycle, because it requires adjustment by the family, who have lived apart for a significant amount of time. This process has the potential to be more difficult for families when a service member returns home after being exposed to high levels of combat and other deployment-related trauma that results in mental health problems. A potential factor in a successful adjustment is the ability of the service member's family to provide the needed support and understanding of the service member's experiences while deployed. Whether family members support or impede adjustment depends upon each individual family member's personal mental well-being, each

individual's understanding of the deployment's impact on the family, and the stability of the family system as a whole. Additionally, military family members are also at risk of being negatively impacted by the service member's deployment and subsequent impaired mental health, which might interfere with their overall well-being and the functioning of the military family unit. The family systems theory provides a theoretical framework for understanding how a family's support and understanding the effects of combat can mitigate, prevent, or aid recovery for someone experiencing mental health problems.

RELEVANCE TO CURRENT STUDY

Family systems theory is an appropriate theoretical framework for the current study. Significant life transitions (such as when teenagers leave for college or other developmental milestones), deployments and reunifications provide families with challenging opportunities, such as adjusting rules of the home and the roles of family members. During these transitions, the family structure must adapt, establishing a new equilibrium by modifying rules, roles, and relationships. Most military families can cope and adapt effectively by developing a new, healthy, and functional equilibrium.

However, other families struggle. The combination of post-deployment adjustment and psychological impairment often leads to strained partner relationships, diminished parent-child relationships, and increased anger in the home, all of which leads to low family cohesion (Batten et al., 2009; Khaylis et al., 2011; Ray & Vanstone, 2009). The impairment of individual mental health and relationships experienced by the military family can often seep into other social and occupational environments, creating more complications (Worthen, Moos, & Ahern, 2012). The

stresses of reintegration and post-deployment adjustment challenge the family's homeostasis, potentially putting the family in a state of chaos. The family may have difficulty creating a new, functional equilibrium, resulting in undefined family roles, rules, and boundaries and thus negatively impacting the internal and external environments.

Relationships and interactions within families are reflected in the well-being of the other family members. For example, one family member's difficulties in coping with stress, such as combat exposure, impact other family members. Furthermore, the family members' responses to someone experiencing stress has the potential to either alleviate or intensify that person's symptoms. Additionally, impairment or strain on one system negatively impact other family systems, such as the effects of spousal relationships on parent-child relationships (Paley et al., 2013). Family separation is a natural condition of military life. However, a service member's negative combat experience can disrupt both their post-deployment adjustment after returning home and the functioning of their family system.

IMPACT OF COMBAT EXPOSURE ON POST-DEPLOYMENT ADJUSTMENT

As a part of their reintegration from deployment, service members are required to undergo medical screenings to assess their potential medical and behavioral health needs. It has been estimated that 15–20% of service members who have undergone a screening will require a formal referral for a more thorough behavioral health assessment to discern their immediate and potential ongoing mental health needs (Hoge et al., 2006; Khaylis et al., 2011; Milliken et al., 2007). If not treated appropriately, mental health problems—such as PTSD and depression—have the potential

to negatively impact the service member's post-deployment adjustment and interfere with their successful reintegration with their family (Batten et al., 2009; Laser & Stephens, 2010).

Service members with PTSD and other mental health conditions can cause additional stress in the lives of their family members, negatively affecting the family members' ability to function. Research has suggested that service members with PTSD can produce secondary traumatization in other family members (Ahmadi, Azampoor-Afshar, Karami, & Mokhtari, 2011); this research has also established a link between PTSD and psychological distress in both military spouses (Campbell & Renshaw, 2012; Roy & Skidmore, 2012) and the adult children of military fathers with PTSD (Dinshtein et al., 2011). Spouses are at greater risk of developing similar mental health symptoms; at times, they begin to show symptoms of their spouse's disorder, resulting in a chaotic home environment. A sample of military spouses (N = 940) who were in various stages of the deployment cycle was anonymously surveyed. Survey participants were asked questions about their mental health status. The findings showed that 20% met the criteria for a major depressive disorder or a generalized anxiety disorder. When a subset of the total surveyed (36%) was analyzed, it was found that over 10% met the criteria for PTSD (Eaton et al., 2008).

Studies have also been conducted to assess the impact that deployment stress and combat-PTSD has on couples. According to these studies, couples with a service member who experienced deployment and manifests symptoms of PTSD report greater marital difficulties than couples who have either not experienced a recent deployment and/or the presence of significant PTSD symptoms. The more significant the PTSD symptoms, the lower the marital satisfaction for both the service member and the spouse; of specific concern were confidence in and dedication to the relationship (Allen, Rhoades, Stanley, & Markman, 2010). Additionally, service members who

experienced symptoms of depression post-deployment reported a decrease in marital quality and trust and an increase in infidelity and separation or divorce. Although the current literature does not support the conclusion that deployments lead directly to divorce, it is important to note that problems that develop in a family may take several years to manifest. The divorce rates of military couples in 1996—a period of non-deployment—were the same as those between 2001 and 2005—a period of high-tempo deployment (Riviere & Merrill, 2011).

Deployments are also difficult for children. The impact of deployments on children is often displayed by a regression in their physical and mental health, including increased acting out at home and at school, decreased participation in activities, and/or a decline in school attendance and grades (Hollingsworth, 2011). Furthermore, studies have demonstrated that the children of a parent with PTSD may develop similar symptomology later in their lives, resulting in mental health concerns and requiring treatment (Basham, 2007). The emotional numbing and isolation that is often displayed by service members with PTSD in an attempt to protect the family can negatively impact the child-parent relationship (Herzog et al., 2011). Environments afflicted by the negative outcomes of deployment often expose children to increased violence, physical and emotional abuse, and detachment from their parents (Basham, 2007; Herzog et al., 2011). Positive family support can promote favorable post-deployment adjustment by acting as a buffer against or ameliorating negative symptoms and behaviors related to negative combat experiences.

IMPACT OF SOCIAL/FAMILY SUPPORT ON PSYCHOLOGICAL WELL-BEING

The days and months following a completed deployment can be the most difficult for a military family and can be a significant source of stress. The families are required to develop a new functional norm that will differ from their level of functioning prior to and during the

deployment. The returning service member is required to integrate with a family structure that has changed since the deployment and must to learn manage and to cope with the stressors and experiences of a deployment, which factors often lead to negative mental health outcomes.

As described, post-deployment adjustment can be positively impacted by the presence of a social network, such as a supportive family and marital satisfaction. Welsh et al. (2015) summarizes that emotional support and concrete resources acquired from individuals or an intimate network, rather than a large network, protects people from negative outcomes following exposure to significant stressors through promoting healthy coping techniques. Major illnesses, loss/grief, and combat exposure are examples of stressors where social support has been studied and have been found to promote positive adjustment and well-being.

Additionally, studies have established that significant others play a crucial role in psychological adjustments to individuals who are exposed to significant stressors (Welsh et al., 2015). It has been shown that the quality of marriage positively impacts both physical health and psychological well-being. Positive mental well-being has been connected to marriages described as happy; poor mental well-being is experienced where marriages are described as unhappy, (Grove, Hughes, & Style, 1983). Generally, the mental well-being of married people is perceived as being better than that of non-married people, who experience more psychological distress, including depression and anxiety. Social, emotional support contributes to a quality marriage and positively impacts physical and mental well-being (Ross, Mirowsky, & Goldsteen, 1990). This current study argued that having a strong, supportive family and marriage will promote positive post-deployment adjustment following a combat deployment.

SUMMARY

This chapter provides an overview of the family systems theory, which serves as the theoretical methodology for this study, and reviews the literature on both the importance of social support in mitigating negative mental health outcomes caused by significant stress, as well as the potential negative impact that combat deployments have on both service members and their families. Combat deployments can have debilitating consequences for returning service members. These consequences can also negatively impact the well-being of a service member's family. As has been shown, positive family functioning and support have the potential to improve the post-deployment mental health adjustment of servicemen. The support and understanding of family members can aid the healthy adjustment of a service member returning home or prevent service members from negatively responding to their deployment experience. Complications related to service members' post-deployment adjustment may potentially be mitigated when their families have the ability to maintain equilibrium by effectively adapting and changing the family structure, rules, and relationships during and following post-deployment integration.

Chapter 3

METHODOLOGY

This chapter contains a discussion of the present study's research methodology. The primary research design will be a secondary data analysis that utilizes data collected from a previous study by the Walter Reed Army Institute of Research (WRAIR). The aim of this current study will be to contribute to our understanding of how combat exposure and marriage quality impacts the development of or mitigation of post-deployment behavioral health symptoms. Specifically, this study will attempt to understand the roles that combat exposure and perceived marriage quality play in the post-deployment mental health adjustments of service members who have returned from their combat deployments to Iraq in 2005. Additionally, this study will attempt to understand how marriage quality functions as a moderator of post-deployment mental health adjustment following significant combat exposure. This chapter will begin with a discussion of the research design and instrumentation of the original WRAIR study, both of which significantly influences the current study's research design and method.

ORIGINAL WRAIR STUDY

WRAIR conducted an experimental longitudinal study under protocol #862 to assess the possible benefits of early debriefing interventions for service members returning from a year-long combat deployment to Iraq. As elements of the brigade that was redeployed between July and August 2005, soldiers going through the standard seven-day reintegration process were randomly assigned to one of four study conditions after being stratified by unit type (combat arms vs. support units). Seventy-seven percent (N = 2297) of the soldiers briefed about the study met the inclusion

criteria and provided informed consent to participate in the study. The four reintegration training conditions for the study's participants included: 1) stress education (treatment as usual); 2) Battlemind debriefing; 3) small Battlemind training; and 4) large Battlemind training. The aim of each condition was to provide psychoeducation to promote healthy post-deployment adjustment, although the interventions differed according to group participation and cognitive orientation. Participants completed a baseline survey prior to participating in their assigned training condition; they also completed an evaluation after receiving the training (Time 1). As part of the longitudinal study, participants completed follow-up questionnaires at four months (Time 2) and twelve months (Time 3) following deployment. Only the data collected at Time 1 and Time 2 were used to complete the analysis assessing the effectiveness of the interventions.

The original study compared the effectiveness of different interventions, which were based on the intervention that would receive the highest post-intervention ratings, demonstrate fewer mental health symptoms over time, and support a decrease in the stigma related to seeking help for mental health problems. Surveys that incorporated multiple measures (not all of which were analyzed during the original study) collect information about demographic variables, the levels of stress before and after training conditions, perceptions of the training conditions, the severity of behavioral health symptoms (PTSD, depression, and sleep), and the stigma related to seeking mental health care. Detailed descriptions of the measures utilized in the original study, which were used in the current study, will be presented in the methodology section that follows in this chapter.

The original study used mixed-effect models to analyze the data and to determine the effect differences between the post-intervention ratings (Time 1 data only) and behavioral health outcomes (Time 1 and Time 2 data only). The attrition rate at four months was 53.9% (N = 1060),

with no significant difference noted from the original sample size—with the exception of senior ranking soldiers (Officers and Noncommissioned Officers), who experienced greater attrition compared to lower-enlisted soldiers. The original study was conducted at unit level and not individual level, where an attempt to locate individual participants was not conducted. Participants available on the day the survey was administered was asked to complete the survey. The attrition at follow-up was attributed to military culture; participants were variously moved to a new duty base, put on leave, became sick, or became engaged in other military requirements and duties (i.e., military schooling).

To determine the effect size, the sample was divided into thirds based on the combat exposure reported at Time 1. When comparing the three treatment conditions to stress education (treatment as usual), the *d* effect size for posttraumatic stress, depression, and sleep problems generally ranged between .20 and .30 for participants who reported high combat. The effect sizes of less than .20 were noted for participants who had encountered the same levels of combat exposure and who received the small Battlemind training condition. Additionally, for stigma, the large Battlemind training condition had a substantial effect size (.25) in the same population. For the remaining two thirds of the sample, effect sizes ranged between .15 and -.14, with 58% ranging between .05 and -.05. The greatest effect size was .15 and was found between the large Battlemind training condition and depression in the sample population among those reporting low to moderate combat exposure.

The original WRAIR study concluded that, when compared with traditional stress education treatment, the three Battlemind interventions resulted in fewer mental health symptoms. Service members with PTSD symptoms who reported high levels of combat exposure benefitted

from all three Battlemind intervention conditions. Battlemind debriefing also achieved the same result for depressive symptoms in the same population of service members. Compared to stress education, service members who received large Battlemind training displayed fewer symptoms of depression, regardless of their combat exposure level. Service members with high levels of combat exposure, who received Battlemind debriefing or small group Battlemind training, reported fewer sleep difficulties. In relation to stigma, large group Battlemind training resulted in fewer concerns about stigma among those service members who had been exposed to high levels of combat. Last, Battlemind debriefing and Battlemind training were better received in the areas of atmosphere and unit cohesion as well as during the teaching of specific skills to support reintegration (Adler et al., 2009). In summary, the Battlemind debriefing and the two Battlemind training conditions yielded better results when high combat exposure was present as compared to stress education (treatment as usual). Despite the original WRAIR study's positive results, the WRAIR study did not explore how family support may have impacted their findings, specifically in terms of behavioral health outcomes.

PRESENT STUDY: RESEARCH DESIGN

The present study is an exploratory secondary data analysis that uses data from the original WRAIR study. The WRAIR study was approved by an institutional review board (IRB) at Walter Reed Army Institute (WRAIR). IRB approval for this study was requested and approved at the University of Texas at Austin. Access to the anonymized data was granted through a partnership between the University of Texas at Austin and WRAIR, which allowed the use of data collected at all three collection points. The goal of this secondary analysis is to assess the impact that combat

exposure and perceived marriage quality has on post-deployment adjustment for service members who were exposed to combat. This study poses three research questions: 1) Is there a relationship between combat exposure on post-deployment adjustment in combat-exposed service members, as measured by reported behavioral health symptoms after controlling for age, rank, and gender? 2) Is there a relationship between marriage quality on post-deployment adjustment in combat-exposed service members, as measured by reported behavioral health symptoms after controlling for age, rank, and gender? 3) Does marriage quality moderate the relationship between combat exposure and reported behavioral health symptoms of service members post deployment? These questions are conceptualized using the family systems theory to understand whether healthy/stable family support can moderate the development of mental health problems and/or contribute to healthy adjustment.

The literature review argued that family support has a positive effect on mental well-being and adjustment when significant stress is experienced. Likewise, we hypothesize that service members who experience greater combat exposure will report more significant behavioral health symptoms following their combat deployment, as compared to (1) service members who report fewer combat experiences and (2) service members who perceive their marriage quality as more positive or supportive; these last two groups will report fewer behavioral health symptoms. Finally, we hypothesize that marriage quality will moderate the relationship between combat exposure and reported behavioral health symptoms, such that a positive or supportive marriage quality will lessen the impact of combat exposure on subsequent behavioral health.

POPULATION

As a secondary data analysis, this study used the data from the original WRAIR study of active duty service members who returned from a year-long deployment in Iraq in 2005 (Adler et al., 2009). The inclusion criteria of the original study were those service members who reported being married, who were a minimum of 18 years of age, and who had been deployed with the BCT that had returned from the most recent deployment. There were no exclusion criteria. This resulted in 2,297 participants at Time 1 of the study. The sample population of the present study included participants who reported 'being married' at Time 1 and Time 2 of the original study. As such, the primary sample population for this study was a subset (Time 1 N = 840, Time 2 N = 244) of the original WRAIR study's population.

MEASURES

The following are descriptions and overviews of the significant measures used by the present study to obtain demographic information about the participants and significant variables. Additionally, Table 1 summarizes the variables for this study, indicating the variable type, the level of measurement, and the potential response by participants.

Demographic information. Both surveys collected demographic information related to age, gender, marital status, ethnicity, education level, rank, military occupation, length in current unit, unit type, and years in the military. The rank variable was recoded with one of three subgroups (Junior Enlisted, Senior Noncommissioned Officers (NCO), and Officer/Warrant Officers).

Combat experiences. A 39–item Combat Experiences Scale (CES), with six scale factors, was used in the original WRAIR study to conceptualize combat exposure. This scale was administered at Time 1. The scale was adapted from the Land Combat Study (WRAIR Protocol #1026) and developed by previous WRAIR studies that measured combat experiences in both peacekeeping and combat deployments (Adler et al., 2009; Adler, Britt, Castro, McGurk, & Bliese, 2011; Adler et al., 2008; Castro, Adler, McGurk, & Bliese, 2012; Hoge et al., 2004; Stretch, Wright, Bliese, Knudson, & Hoover, 1996; Wilk et al., 2010; Wilk et al., 2013). The scale asks if a variety of combat experiences were experienced during recent deployment (in the form of yes/no responses), including the severity of the stress associated with the experience (Likert Scale: 1–Not at all to 5–Extremely). The scale consists of six factors, with five measuring negative combat experiences. The sixth factor measures positive combat experience (four items), which was not be included in this study's analysis. OIF veterans have been studied using the CES, in which the five factors that were be used in this current study have demonstrated satisfactory agreement, discriminant validity, and good-fitting model (Wilk et al., 2010; Wilk et al., 2013). Reliability indexes, such as Cronbach's alpha, have not been estimated for the CES, as the measure is a formative construct and not a reflective construct (Wilk et al., 2013).

The items used to assess combat experiences in prior studies have ranged from 16 to 39; this study used 34 of the 39 total items from the CES. These items measure negative combat experiences. The sum of the scale, ranging from 34 to 68, defines the level of combat experiences; a higher score indicates a greater level of negative combat experiences:

- Fighting (i.e., being attacked or ambushed)

- Killing/injuring (i.e., being directly responsible for the death of an enemy combatant or non-combatant)
- Perceiving a threat to oneself (i.e., participating in improvised explosive device/mine clearing operations)
- Being exposed to the death/injury of others (i.e., seeing dead bodies or human remains)
- Witnessing atrocities (i.e., seeing children or women who were victims of war)
- Having positive combat experiences (i.e., saved the life of a soldier or civilian)

Posttraumatic stress symptoms. The Posttraumatic Stress Disorder Checklist (PCL) (Weathers, Litz, Herman, Huska, & Keane, 1993) was used to assess the severity level of posttraumatic stress that participants experienced within the last month, as the symptoms related to traumatic events experienced while deployed. The PCL is a 17–item scale that coincides with the diagnostic criteria of PTSD (American Psychological Association, 2000, 2013). It utilizes a Likert Scale (1–Not at all to 5–Extremely) to report the extent to which someone has been bothered by a particular PTSD symptom within the past month. The summed score of the scale provides a continuous measure, where a higher score indicates the experience of more de-stressing symptoms. The PCL score ranges from 17 to 85, with a cut-off score of 50 serving as a good indicator of a PTSD diagnosis in members of the military (Hoge et al., 2004; Weathers et al., 1993; Wilk et al., 2013).This measure has been used both in clinical practice and in research with a variety of populations, including the military. One study assessed its clinical efficiency for soldiers returning from a combat deployment (P. D. Bliese et al., 2008).

The PCL has demonstrated to be an efficient self-report measure used when screening for PTSD. (Weathers et al., 1993) reports high internal consistency between all 17 items of the measure and the three symptom clusters (re-experiencing, avoidance, and hyperarousal) for PTSD, as defined in the DSM-III-R. The PCL only moderately correlates to other PTSD measures (The Mississippi Scale, the MMPI-2's PTSD scale, and the Impact of Event Scale)—with combat exposure as the trauma—but strongly correlates with other measures for non-combat trauma (Weathers et al., 1993).

Depression symptoms. Symptoms associated with depression were collected using the Patient Health Questionnaire-9 (PHQ-9) (Spitzer, Kroenke, & Williams, 1999). This scale is based on the diagnostic criteria for Major Depressive Disorder (MDD) (American Psychological Association, 2000, 2013). The questionnaire asks respondents how bothered they were by their problems over the past four weeks (not at all, few or several days, more than half the days, and nearly every day). One question asks the respondents how these problems have made it difficult for them to function on a daily basis (not difficult at all, somewhat difficult, very difficult, and extremely difficult). The summed scale, ranging from 10 to 40 for this current study, provides the severity of depressive symptoms experienced by the participants.

The PHQ-9 is a subset scale that was developed from two sources: (1) the provider-administrated Primary Care Evaluation of Mental Disorders (PRIME-MD) and (2) the patient-administered Patient Health Questionnaire (PHQ). The PRIME-MD supported providers as they assessed for possible mental health diagnoses (depressive, anxiety, alcohol, somatoform, and eating disorders) in a primary care setting. (Spitzer et al., 1999) studied the PHQ to determine its validity and utility as compared to the PRIME-MD; their findings indicated that the PHQ had

diagnostic validity comparable to the PRIME-MD. The self-administrated measure in predicting a mental health diagnosis was nearly identical to a clinical interview with a mental health professional (MHP). Of note, the PHQ demonstrated greater sensitivity to major depressive disorder than the Prime-MD, with a correlation of .84 for depressive symptom severity between the PHQ-9 and MHP (Spitzer et al., 1999). The PHQ-9 has been studied in both civilian and military populations to assess for depressive symptoms (Hoge et al., 2004; Spitzer et al., 1999; Wilk et al., 2010).

Alcohol problems. At Time 2, the survey included items asking about alcohol use problems. These items were not included at Time 1, as the service members were returning from deployment, where alcohol consumption is not allowed. The Two Item Conjoint Screen (TICS) was used on the survey to measure alcohol problems (Brown, Leonard, Saunders, & Papasouliotis, 2001). The TICS assessed behavior (wanted/needed to cut down and used more than intended within the past four weeks) through dichotomous responses (yes/no). The sum of the items, ranging from 2 to 4, provided the severity of alcohol problems that were being experienced by the participants.

The TICS was developed by Brown **et al. (2001)**, in whose study alcohol and drug use screening items were identified by using an extensive literature search and focus groups. This process initially resulted in nine items that were studied in two phases, then filtered to only five items. Data were collected using (1) clinical interviews that incorporated the five items, (2) the Composite International Diagnostic Interview—Substance Abuse Model (highly regarded due to its reliability test-retest design), and (3) other methods to support the study. Comprehensive

analysis of the data and varied combination of the items resulted in the identification of the two-item TICS, with sensitivity and specificity near 80% for both items (Brown et al., 2001).

Perceived family support. Participants' perceptions of family support were collected using four of the six items from the Quality of Marriage Index (QMI) (Norton, 1983). The items asked about relationship satisfaction using a five-point Likert Scale (strongly agree to strongly disagree) in order to assess marriage quality, stability of the relationship, how happy the relationship makes the participants and if they feel like they and their spouse are a part of a team. The score range for this measure is 4 to 20, where a higher score indicates greater relationship satisfaction. The QMI index was repeated during the four-month and twelve-month follow-up surveys.

Norton (1983) examines the operationalization of marriage quality indexes and reviews the development of the QMI by discussing the multiple advantages and strong properties of this measure over similar measures. A meta-analysis of relationship satisfaction measures found the QMI reliability score to be high (.944), with greater reliability for older and established relationships as compared to newer relationships (Graham, Diebels, & Barnow, 2011). A cross-sectional study examined the potential benefits of forgiveness during the first two years of marriage. The QMI was a measure used in a study, in which the internal consistency ranged between .93 to .96 for husbands and .94 to .95 for wives at the four data-collection points throughout the course of the study (McNulty, 2008). Although this study does not use the full six-item measure, the items incorporated in the survey served as a good indicator of marriage quality or relationship satisfaction.

STUDY VARIABLES AND COVARIATES

Dependent variables. In this study, the dependent variable are mental health outcomes that were measured during the four months following deployment. Mental health outcomes were conceptualized as reported levels of posttraumatic stress symptoms, depressive symptoms, and alcohol use problems. The individually summarized scores of the PCL, PHQ-9, and the two-item questions for alcohol problems were used to assess the levels of mental health problems that the participants experienced. The higher the score, the more severe the concerns or problems were that were being experienced. The PCL and PHQ-9 were utilized in both surveys at Time 1 and Time 2, where changes in reported scores indicate an increase or decrease of posttraumatic stress or depressive symptoms. The same cannot be said for alcohol use problems, as this data was only collected with the Time 2 survey.

Independent variables. In this study, perceived marriage quality and combat experience are the independent variables. As reviewed in Chapter 2, informal social supports (i.e., family) have been found to improve a service member's ability to cope with combat experiences (Greenberg et al., 2009), significant others can play a significant role in a service member's psychological adjustment following exposure to stress (Welsh et al., 2015), and marriage quality affects psychological well-being (Grove et al., 1983). With family support, relationship satisfaction, and marriage quality serving as both buffers and support of psychological well-being, the scores from the QMI measure were used in this study to represent the variable of marriage quality. Perceived marriage quality was conceptualized using the four items of the QMI that report on elements of marriage satisfaction. The summarized scores from the Likert scale were used to assess the level of perceived marriage quality, where a higher score is indicative of

increased support. Perceived marriage quality was assessed at both data collection points, allowing one to track changes in how participants perceived both their satisfaction with and the quality of their marriage. The primary focus was on the change in behavioral health outcomes in comparison to perceived marriage quality, as reported by the participants over time.

Combat experiences were assessed using the combat experiences scale, assessing the participants' total number of combat experiences. Combat experiences were only collected at Time 1 of the original study, providing a baseline of the functioning level of the participants, while accounting for the level of behavioral health symptoms reported as a result of exposure to and the severity of combat while deployed in Iraq. The greater the sum of the score on the combat experiences scale, the greater the exposure to combat events (being attacked, being wounded, engaging in direct or indirect fire) and/or the level of stress being experienced by the participants.

Covariates. The covariates for this study were age, rank, and gender. Controlling for these factors provided a more accurate picture of the impact that perceived family support has on behavioral health outcomes. Rank was obtained at both data collection points by asking participants their current rank (enlisted, officer, or warrant officer) in relation to their level within the rank (one through ten). Gender was a categorical variable that asked participants to select from two options: male or female.

Table 1: Study Variables

Variable type	Variable	Level of Measurement	Potential response
Dependent	Posttraumatic stress—PCL (17 items)	Continuous	Range 17–85
Dependent	Depression–PHQ-9 (10 items)	Continuous	Range 10–40
Dependent	Alcohol problems (2 items)	Continuous	Range 2–4
Independent	Perceived family support (4 items)	Continuous	Range 4–20
Independent	Combat experiences (34 items)	Continuous	Range 34–68
Covariate	Age	Continuous	Range 18–70
Covariate	Rank	Categorical	Enlisted: E1–E4 Senior NCO: E5–E9 Officer/Warrant Officer: O1–O6/W1–W5
Covariate	Gender	Categorical	Male/Female

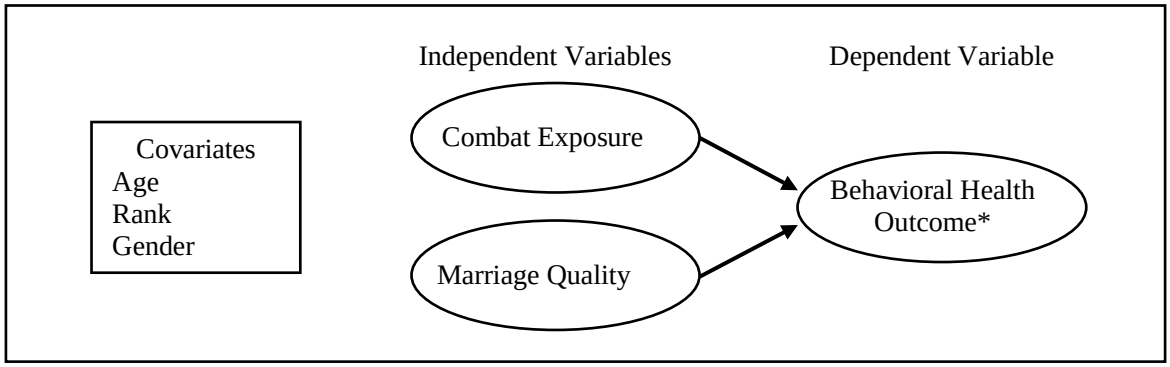
Data analysis plan. This study utilized multiple approaches to summarize the study sample, to evaluate possible significant changes in scores of key variables (posttraumatic stress symptoms, depressive symptoms, and marriage quality) over time, and to determine the relationships between the independent variables and the dependent variables. All analyses for this study were conducted with SPSS (version.25, 2017). Descriptive statistics summarized aspects of the study population (age, gender, and rank) and examined potential differences between the population of the original WRAIR study and the population at Time 1 and Time 2 of this study. The mean age is reported for the original WRAIR study sample and this study's samples at Time 1 and Time 2 as well as a breakdown of the sample by gender and rank, expressed by composition number and percentage. To determine if there were any significant changes in scores of key

variables between Time 1 and Time 2 paired-sample t-tests were conducted. Comparison of the means between posttraumatic stress symptoms and depressive symptoms are reported, and findings discussed. Additionally, an assessment of any possible violation of the assumptions underlying the regression analyses were conducted to ensure that Hierarchal Multiple Regression (HMR) analyses could be used for this study.

Hierarchal Multiple Regression (HRM) was used to test the hypotheses. HRM is used to assess the correlation or relationship between a set of independent variables and dependent variables. In addition, HRM allows independent variables to be controlled or blocked, which permits the analysis to create multiple models that demonstrate the unique contribution or predictability that variables of significance give to the dependent variable (Pallant, 2013). Multiple HMR analyses were run to test the relationship of the independent variables on each of the dependent variables. Posttraumatic stress symptoms and depressive symptoms were collected at two different points of time, where alcohol use problems data was only collected at Time 2 survey. Table 2 provides a conceptual model of the HMR with which to test the three hypotheses.

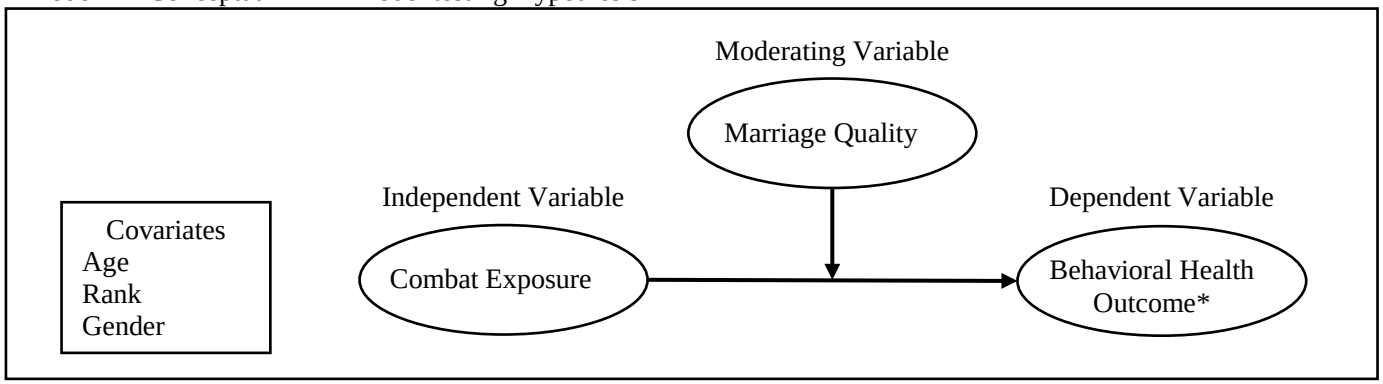
Table 2: Conceptual Hierarchical Multiple Regression Models

Model 1—Conceptual HMR Model testing Hypothesis 1



*Behavioral Health Outcomes—Posttraumatic Stress Symptoms, Depressive Symptoms, or Alcohol Use Problems

Model 2—Conceptual HMR Model testing Hypothesis 2



*Behavioral Health Outcomes – Posttraumatic Stress Symptoms, Depressive Symptoms, or Alcohol Use Problems

For the analyses, a three block (or step) approach was used to determine if there were any statistically significant relationships. The covariate variables (age, rank, and gender) were controlled for by being entered into Block 1 to create the first model. The second model tested the first two hypotheses by entering the independent variables (combat exposure and marriage quality) into Block 2 for each analysis on the dependent variables. Last, the third hypothesis was examined to determine the predictability of marriage quality as a moderating variable on the relationship between combat exposure and behavioral health outcomes; this was examined by entering an interaction variable in the third block. Additional HMR models for Junior Enlisted and Senior

NCOs were run on all three dependent variables at Time 2 as a result of disparate mean levels in posttraumatic stress symptoms between the three grouped ranks (PTSS means for study sample = 32.06, Junior Enlisted = 36.56, Senior NCOs = 30.29, and Officers/Warrant Officers = 22.18). Analyses were not run for the Officer/Warrant Officer (N=15) sample due to small sample-size. This analysis aimed to determine if there were any statistically significant mean disparities for the dependent variables.

Missing data. The multiple imputation method was used to manage missing data for this study. An attempt was made to use pairwise deletion. However, after assessing and reviewing the data, it appeared that more than 5% of cases were missing data in some of the key variables, thus making multiple imputation the better choice. The missing data analysis determined that five of eight variables at Time 1 and seven of nine variables at Time 2 had less than 5% of cases missing data. Depressive symptoms (5.6%) had just over 5% of cases missing data at Time 1 and approximately 15% of cases missing data for combat exposure scores (14.88%) and subsequently the interaction variable (15.6%) of combat exposure scale and marriage quality for the same period of time. At Time 2, combat exposure (13.11%) and the interaction variable (13.5%) had similar findings with approximately 13% of cases missing data. In SPSS, missing data was imputed with a random component to create five full, random data sets. Each data set is analyzed separately, and the results are combined to account for the variation in parameter estimates. This will result in unbiased parameter estimates and a full sample for the HMR.

STUDY LIMITATIONS

This study's limitations arise from its use of secondary data from a primary study that was designed for a different purpose. The aim of the original WRAIR longitudinal study was to assess

the effectiveness of early interventions in an at-risk population. The questionnaires were designed to determine which intervention would contribute to a decrease in those behavioral health problems that are commonly experienced following a combat deployment, which is a different goal than that of the present study. The measures utilized in the WRAIR study were not specifically selected or developed with the current research question in mind. Furthermore, the use of secondary data prohibits the ability to select instruments that may have applicability to this study.

An additional limitation lies in the use of self-report questionnaires. Such questionnaires provide a convenient and inexpensive way to collect data (Rubin & Babbie, 2010). When well-constructed, they have the ability to obtain useful information related to demographics and identified variables that are related to specific research interests. Nevertheless, the interpretation of the survey items is left to the participant, despite the careful clarifications and specifications provided during the development process of the questionnaire. Finally, the use of self-reports instead of interviews raises the possibility that symptoms will be underreported due to perceived stigma or social undesirability. Over-reporting may occur if a response is perceived to have the potential to grant additional benefits. The former is of specific concern to the participants, who are fearful that military leaders might learn of their struggles with mental health problems.

A further limitation of this study is the potential impact of missing data on the results of the analysis. Approaches to handling missing data often include deletion or imputation, which changes the data and skews the sample being studied. The advantage of deletion lies in the simplicity of the method and its comparability; its disadvantages involve lowering the statistical power because of the smaller sample size and the recusal of data from the analysis. Multiple imputation can handle the uncertainty that the missing data causes by creating several different plausible imputed data sets and appropriately combining the results obtained from each of them.

However, this approach can be problematic, as it creates different estimates—and potentially different results—each time that it develops (Humphries, n.d.).

Last, using modified measures, whose validity and reliability have not been determined, may impact the results and findings of this study. To assess participants' level of alcohol problems and perceived family support, partial measures were used. These measures draw from other measures (AUDIT-C, TICS, and QMI) that have been studied for validity and reliability. Nonetheless, the present study's approach was still limited by the lack of direct validity and reliability of its measures. This exists, despite the fact that the selected items used on the surveys capture specifics areas of interest related to the study, such as marriage satisfaction and stability, or key elements indicative of someone having problems with alcohol (frequency and amount).

SUMMARY

This chapter has provided both a summary of the original WRAIR study and details of the methodology and research design that were utilized in the current study; the chapter has also identified this study's limitations. This study was a secondary data analysis of data collected from a previous study, which surveyed active duty service members who were returning from a year-long combat deployment in Iraq. This study incorporated the use and analysis of secondary data on perceived family support, which data has not been previously studied. The research question that guided this study was to better understand the impact that family support has on buffering against mental illness and supporting healthy adjustment. Participants in this study are active duty service members who have returned from a year-long combat deployment in Iraq. Two of the three surveys that were administered during the year following the deployment were used in this study,

capturing data on a variety of research topics and interests. Specific variables of interest for this study included combat exposure, perceived family support, and behavioral health outcomes.

Chapter 4

RESULTS AND FINDINGS

In this chapter, the results of the study will be presented. Demographic characteristics will first be discussed, including a comparison between the original study's population and this study's population. This will be followed by (1) a summary of the reliability of the measures used in the study and (2) the findings of the paired-sample t-tests and (3) the findings of the Hierarchical Multiple Regression (HMR) analyses. An analysis of each outcome variable (posttraumatic stress, depressive symptoms, and alcohol use problems) was conducted at each collection time point to examine the hypothesis of whether or not marriage quality has a moderating effect on behavioral health outcomes that result from significant combat exposure. The chapter will conclude with an interpretation and discussion of the findings.

DEMOGRAPHICS

The population sample for this study was a subset of the original WRAIR study, in which participants consented to the study at both Time 1 and Time 2 and reported "being married." Additionally, the participants had to be a minimum of 18 years of age and had to have returned from a recent deployment in Iraq (2004–2005). This study's sample compared to the original WRAIR study sample were similar for gender but included some notable differences in rank and age (Table 3). The present study's populations, when compared to the original study's population, had fewer Junior Enlisted than Senior Noncommissioned Officers (NCOs), and this current study's population was older by just under 2.5 years. It does not seem unreasonable to the note the age difference when considering that being married implies that the current study's population is more senior in rank and older in age.

Table 3: Population Demographic Characteristics by Time

	Original Study N = 2297		Time 1 N = 840		Time 2 N = 244		Comparison Group[4] N = 596	
Characteristic	**Number**	**%**	**Number**	**%**	**Number**	**%**	**Number**	**%**
Gender								
Male	2181	94.9%	818	97.4%	241	98.8%	577	96.8%
Female	95	4.1%	17	2.0%	3	1.2%	14	2.3%
Rank								
Junior Enlisted[1]	1276	55.6%	278	33.5%	86	35.4%	188	31.6%
Senior NCO*[2]	864	37.6%	489	59.5%	142	58.3%	365	61.1%
Officers/Warrant Officers[3]	157	6.8%	58	7.0%	15	6.3%	44	7.3%
Age - Mean	25.88		28.85		27.75		29.47	

1) Junior Enlisted: E1–E4; 2) Senior NCO: E5–E9; 3) Officer/Warrant Officer: O1–O6, CW1–CW5;
4) Comparison Group: Time 1 sample not included in Time 2 sample
* NCO: Noncommissioned Officer

Comparing the means of the three populations did not yield any remarkable differences (Table 4) in the reported behavioral health outcomes, exposure to or experiences during combat, and marriage quality. These observations on the key variables indicate that the make-up of the three populations are similar. It is important to note that there are no data available for either the original population or this study's Time 1 population for alcohol use, as this behavior outcome was not measured at this point in time.

Attrition. This study resulted in a 71% attrition rate from Time 1 to Time 2. As this study utilized the data from the original WRAIR study, the attrition from Time 1 to Time 2 can be contributed to the study design of focusing on unit level participation and not individual participation, as well as military culture previously discussed in this chapter. In addition, the attrition for Time 2 sample is that only participants that reported that they were married, living with spouse (N = 244) were included in the study compared to reporting another married status;

single, never married (n = 1), married, but separated (N = 26), married, geographically separated (N = 40), divorced (N = 9), or widowed (N = 0) at Time 2 (N = 324, missing = 4). Tables 3 and 4 include a column that summarizes demographic characteristics and means of the key variables of the participants that were missing at Time 2 to determine any significant differences in the sample.

In review of the comparison group of the sample from Time 1 not included in the Time 2 sample, there was not any significant differences in the characteristic demographics for gender or rank. The comparison group was determined to be approximately 3.5 years older than the original WRAIR study sample and approximately 1 year older than the samples of this study. The only noted difference of the means of the key variables is that the mean of posttraumatic stress symptoms was slightly higher (+/- 1) than the samples of the original WRAIR study and the samples of this study.

Table 4: Mean of Key Variables for All Three Populations

	Original Study (N=2297) M	**Time 1** (N=840) M	**Time 2** (N=244) M	**Comparison Group[1]** (N=596) M
Dependent Variables				
Posttraumatic Stress Symptoms (range:17–85)	33.24	33.54	32.06	34.08
Depressive Symptoms (range: 10–40)	15.86	16.08	15.86	16.29
Alcohol Use Problems* (range: 2–4)	-	-	2.22	-
Independent Variables				
Combat Exposure (range: 34–68)	49.22	48.71	48.32	48.79
Marriage Quality (range: 4–20)	15.36	16.50	15.78	16.13

* Alcohol Use Problems was not surveyed at Time; 1) Comparison Group: Time 1 sample not included in Time 2 sample

Due to the significant attrition rate for this study from Time 1 to Time 2 (71%), additional analyses were completed to determine if there were any significant differences in the demographic characteristics and mean scores of key variables between those lost to follow up and the sample population available at Time 2 using Time 1 data. Tables 5 and 6 provide a summary of these results. The mean age difference is just above 2 years older for the sample population lost to follow up (M = 29.47) compared to the sample population at Time 2 (27.34). A Chi-square test for independence was conducted that indicated a significant difference in the mean age, X^2 (32, N = 840) = 46.415, p = 0.048, phi = 0.235. A Chi-square test for independence indicated no significant association between gender and the two sample populations, X^2 (1, N = 835) = 0.625, p = 0.429, phi = -0.37. Additionally, a chi-square test for independence indicated no significant association between rank and the two sample populations, X^2 (2, N = 825) = 4.118, p = 0.128, Cramer's V = 0.071. To determine if there were any significant differences in the scores for the sample populations, independent-samples t-tests were run on key variables. There were no significant differences between the scores of posttraumatic stress symptoms, depressive symptoms, and combat exposure for the two populations. A significant difference was found in the marriage quality scores for the lost to follow up (M= 16.12) and the sample population available at Time 2 (M = 17.44, t (830) = -4.488 p < .000, two-tailed). The magnitude of the differences in the means (mean difference = -1.316, 95% CI: -1.892 to -0.740) was small to moderate (eta squared = 0.023).

Table 5: Population Demographic Characteristics of Sample Population (Completers vs Lost to Follow at Time 2) using Time 1 Data

	Completers N = 244		**Lost to Follow Up N = 596**	
Characteristic	**Number**	**%**	**Number**	**%**
Gender				
Male	241	98.8%	577	96.8%
Female	3	1.23%	14	2.35%
Rank				
Junior Enlisted[1]	93	38.11%	185	31.04%
Senior NCO*[2]	131	53.69%	358	60.07%
Officers/Warrant Officers[3]	15	6.15%	43	7.21%
Age - Mean	27.34		29.47	

1) Junior Enlisted: E1–E4; 2) Senior NCO: E5–E9; 3) Officer/Warrant Officer: O1–O6, CW1–CW5;
* NCO: Noncommissioned Officer

Table 6: Independent-samples T-Test Comparison of Sample Population (Completers vs Lost to Follow Up at Time 2) using Time 1 Data

	Completers N = 244		Lost to Follow Up N = 596
	M	t	M
Posttraumatic Stress Symptoms	31.96	1.692	33.78
Depressive Symptoms	15.38	1.783	16..16
Combat Exposure	48.32	0.737	48.75
Marriage Quality	17.44	-4.488*	16.12

* Significant, $p < .001$

To better understand the study populations at both Time 1 and Time 2, the means to the key variables were assessed in relation to the populations' gender and rank as compared to the overall means for that respective data collection point (Time 1: Table 7; Time 2: Table 8). Overall, there were only a few observable differences. For the female population at Time 1, the mean was 3.5 points lower and 7 points lower for posttraumatic stress symptoms and reported combat

experiences/exposure, respectively, when compared to the overall mean. Additionally, posttraumatic stress symptoms, as reported by the Officers/Warrant Officers, was also 7 points lower for that same time period. Similar results for females were observed at Time 2 for posttraumatic stress symptoms and combat exposure, with a lower mean of 8 points and 5.5 points, respectively. Junior Enlisted participants reported 3 points increase in the mean for posttraumatic stress symptoms when compared to Time 2.

Table 7: Time 1 Means of Key Study Variables by Gender and Rank

		Gender		Rank		
	N=840	**Male (N=818)** M (SD)	**Female (N=17)** M (SD)	**Junior Enlisted (N=282)** (M (SD)	**Senior NCO (N=499)** M (SD)	**Officers/Warrant Officers (N=59)** M (SD)
Dependent Variables						
Posttraumatic Stress Symptoms (range:17–85)		33.57	29.71	33.08	34.12	25.97
Depressive Symptoms (range: 10–40)		16.05	16.60	16.31	16.23	13.67
Alcohol Use Problems* (range: 2–4)		-	-	-	-	-
Independent Variables						
Combat Exposure (range: 34–68)		48.84	42.56	49.08	48.65	47.42
Marriage Quality (range: 4–20)		16.52	15.29	16.09	16.63	17.39

* Alcohol Use Problems was not surveyed at Time 1

Table 8: Time 2 Means of Key Study Variables by Gender and Rank

		Gender		Rank		
	N = 244	**Male (N=241)** M (SD)	**Female (N=3)** M (SD)	**Junior Enlisted (N=87)** (M (SD)	**Senior NCO (N=142)** M (SD)	**Officers/Warrant Officers (N=15)** M (SD)
Dependent Variables						
Posttraumatic Stress Symptoms (range:17–85)		32.14	25.33	36.56	30.29	22.18
Depressive Symptoms (range: 10–40)		15.88	14.00	17.68	15.21	11.62
Alcohol Use Problems (range: 2-4)		2.22	2.67	2.31	2.20	2.00
Independent Variables						
Combat Exposure (range: 34–68)		48.38	43.66	49.10	47.87	48.09
Marriage Quality (range: 4–20)		15.78	15.33	15.70	15.94	14.70

RELIABILITY

Reliability testing was conducted on the five measures used for this study, comparing Cronbach's Alpha (as reported in the literature) to the results of the reliability of the measures at each time point (Table 9). The Combat Exposure Scale (CES) measure has been used in multiple studies, with slight alterations that assess the various combat events that service members can experience and be exposed to, depending on the deployment type (peacekeeping, combat). Due to the modifications with its use in previous studies and its formative properties it would be difficult to directly compare the reliability score of this study with those reported in the literature. The internal consistency for the remaining measure, minus the TICS, appears to be within the ranges reported in the literature. The TICS rated poorly for internal consistency in this study, even though Brown et al. (2001) outline a thorough process for developing the two-item measure, which results in high sensitivity and specificity that support the diagnostic detection of problematic alcohol and substance misuse. It is important to note that the internal consistency of the MQI measure scored higher for the study population compared to that which is reported in the literature. Of note, only four items out of the full six-item measure were used to inquire about the marriage/relationship quality of the study participants.

Table 9: Reliability of Scales (Cronbach's Alpha (α))

	Literature α	Time 1 α	Time 2 α
Combat Exposure Scale (subset)[1]	-	-	-
Posttraumatic Stress Checklist[2]	.97	0.942	0.944
Patient Health Questionnaire-9[3]	.86 / .89	0.887	0.904
Two Item Conjoint Screen (alcohol use)[4]	-	-	0.589
Marriage Quality Index (subset)[5]	0.944	0.975	0.967

[1]Wilk, et al., 2013. [2]Weathers et al., 1993. [3]Kroenke, et al., 2001. [4]Brown et al., 2001. [5]Norton, 1983.

FINDINGS

Preliminary Analysis. Prior to conducting the primary analysis with the Hierarchical Multiple Regression, paired-sample t-tests were assessed to determine if there were any statistical differences in the scores of some of the significant variables, and the assumptions for multiple regression were conducted. Table 10 provides a summary of the results of the paired-sample t-tests. Due to the nature of the secondary data analysis, it is difficult and inappropriate to assume that any change, significant or not, in the scores can be contributed to support the present study's hypothesis. There are too many factors or reasons to consider as possible influences on any changes in the scores, such as the debriefs/interventions used at Time 1 as part of the original study, unknown marriage quality before/during/after deployment, the influence of time, and/or the participants' experiences between Time 1 and Time 2.

Table 10: Paired-Sample T-Test Comparison of Time 1 and Time 2 Scores

	Time 1			Time 2
N =240	M	t	Correlation	M
Posttraumatic Stress Symptoms	32.21	.177	.54	32.06
Depressive Symptoms	15.64	.577	.50	15.86
Marriage Quality	17.42	6.69*	.51	15.78

* Significant, $p < .001$

The results of the paired-sample t-tests for both posttraumatic stress symptoms and depressive symptoms indicated that there is no statistical difference in the scores (PTSS: 0.15 decrease; depressive symptoms: 0.2 increase) from Time 1 to Time 2. However, there was a statistical difference in the marriage quality scores from Time 1 ($M = 17.42$) to Time 2 ($M = 15.78$), $t(239) = 6.693$, $p < .001$ (two-tailed). The decrease in Marriage Quality scores was 1.640, with a 95% confidence interval ranging from 1.158 to 2.118. The eta squared statistic (.16) indicated a medium to large effect size. An estimated 50% of the sample's marriage quality score

was lower at Time 2 compared to Time 1, with no difference in 34% and higher scores in 16% of the sample population. Again, it is not feasible to determine the cause (i.e. intervention, time, etc.) for the statistical difference in the marriage quality scores; it is best to simply summarize that the study population's (n = 244) quality of marriage scores decreased from Time 1 to Time 2.

Assumptions. Prior to conducting the primary analysis, the regression assumptions were assessed to determine the appropriateness of the data for this study. The data did not violate the regression analysis assumptions for sample size, multicollinearity, normality, linearity, or homoscedasticity. The study populations (Time 1: N = 840; Time 2: N = 244) exceeded the recommended minimum sample by having six independent variables. An examination of the independent variables determined that they appropriately correlated with dependent variables and did not correlate excessively with each other. A review of a normal probability plot reveals that the associations of predictor and outcome variables appear sufficiently linear. Assessing the assumption of homoscedasticity demonstrates that there is substantial variability between the variables, even though variability is fairly consistent across the scale, in which differences in variance were small to moderate across the scales.

Hierarchical Multiple Regression with Posttraumatic Stress Symptoms. After controlling for age, rank, and gender, combat exposure and marriage quality were significant predictors of posttraumatic stress symptoms at Time 1 and Time 2. Combat exposure significantly predicted posttraumatic stress symptoms at Time 1 ($b = 3.811$, $t(835) = 6.311$, $p < .000$) and Time 2 ($b = 2.796$, $t(239) = 2.796$, $p = .001$). Marriage quality also predicted posttraumatic stress symptoms at Time 1 ($b = -3.017$, $t(835) = -6.458$, $p < .000$) and Time 2 ($b = =4.221$, $t(239) = -5.037$, $p = < .000$). These results indicate that combat exposure predicted posttraumatic stress symptoms more at Time 1 as compared to marriage quality at Time 1, and marriage quality at Time 2 predicted

posttraumatic symptoms more at Time 2 as compared to combat exposure at Time 1. The HMR analysis found that the interaction variable of marriage quality was not found to be statistically significant at either points in time.

The HRM analyses by rank was not conducted on Officers/Warrant Officers (N=15) due to the small sample-size. The HRM analysis for Junior Enlisted found that marriage quality (b = -3.684, p = .032) predicted posttraumatic stress symptoms, where no significant relationship was found between combat exposure or their interactions at Time 2. For Senior NCOs, combat exposure (b = 2.701, p = .009) and marriage quality (b = -4825, p < .000) were found to predict posttraumatic stress symptoms; no significant relationship between the interaction of combat exposure and marriage quality was found. For Senior NCOs, marriage quality seemed to be a better predictor of posttraumatic stress symptoms than combat exposure.

Hierarchical Multiple Regression with Depressive Symptoms. Similar to posttraumatic stress symptoms, depressive symptoms were predicted by combat exposure (Time 1: b = 1.127, t(835) = 5.056, p < .000; Time 2: b = .939, t(239) = 2.548, p = .011) and marriage quality (Time 1: b = -1.233, t(835) = -6.330, p < .000; Time 2: b = -1.807 t(239) = -5.102, p < .000). The interaction between combat exposure and marriage quality was not found to be statistically significant in moderating the relationship between combat exposure on depressive symptoms at either Time 1 or Time 2.

The results for the HMR analyses by rank found that marriage quality negatively predicted depressive symptoms for Junior Enlisted (b = -1.786, p = .017) and Senior NCOs (b = -1.948, p < .000), where no significant relationship was found between combat exposure or the moderating effect of marriage quality on depressive symptoms at Time 2.

Hierarchical Multiple Regression with Alcohol Use Problems. Alcohol use problems was not measured at Time 1, so HMR was conducted for this dependent variable only at Time 2. Only marriage quality was found to predict alcohol use problems, b = -.075, t(239) = -1.995, $p < .050$. Combat exposure (b = .027, $p = .44$) and the interaction variable (b = .655, $p = .66$) were not found to be significant predictors of alcohol use problems.

The HMR analyses by rank did not find any significant findings for combat exposure, marriage quality, or their interaction variable for either Junior Enlisted or Senior NCOs. Tables 11 and 12 summarize the results of the HMR models for Time 1 and Time 2, as well as the models run by rank at Time 2.

Table 11: Results of Hierarchical Regression Models[1]

	Time 1 (N=840)				Time 2 (N=244)			
Model 2	**b**	**t**	**lower bound**	**upper bound**	**b**	**t**	**lower bound**	**upper bound**
Posttraumatic Stress Symptoms								
Combat Exposure	3.811***	6.311	2.566	5.056	2.796***	3.290	1.126	4.466
Marriage Quality	-3.017***	-6.458	-3.933	-2.101	-4.221***	-5.037	-5.870	-2.573
Depressive Symptoms								
Combat Exposure	1.127***	5.056	0.682	1.573	0.939***	2.548	0.216	1.662
Marriage Quality	-1.223***	-6.330	-1.602	-0.844	-1.807***	-5.102	-2.501	-1.113
Alcohol Use Problems								
Combat Exposure	-	-	-	-	0.027	0.775	-0.042	0.097
Marriage Quality	-	-	-	-	-0.075**	-1.995	-0.151	0.000
Model 3—Interaction Variable								
Posttraumatic Stress Symptoms	-0.775	-1.609	-1.727	0.176	-0.670	-0.680	-2.645	1.305
Depressive Symptoms	-0.210	-1.128	-0.576	0.155	-0.126	-0.277	-1.050	0.797
Alcohol Use Problems	-	-	-	-	-0.019	-0.449	-0.101	0.064

1 – Table only shows results of Model 2 and Model 3 for each analysis run on each dependent variable; Model 1 included covariates (age, gender, and rank)
**p < 0.05; ***p < 0.01

Table 12: Results of Hierarchical Regression Model by Rank at Time 2 (N=244)[1]

	Junior Enlisted (N=87)				Senior NCOs (N=142)				Officers/Warrant Officer[2] (N=15)			
Posttraumatic Stress Symptom	**b**	**t**	**lower bound**	**upper bound**	**b**	**t**	**lower bound**	**upper bound**	**b**	**t**	**lower bound**	**upper bound**
Model 2												
Combat Exposure	3.165	1.822	-0.249	6.579	2.701***	2.615	0.672	4.730	-	-	-	-
Marriage Quality	-3.684**	-2.142	-7.061	-0.308	-4.825***	-4.962	-6.732	-2.918	-	-	-	-
Model 3—Interaction Variable	-0.164	-0.083	-4.120	3.791	-1.114	-0.963	-3.404	1.176	-	-	-	-
Depressive Symptoms												
Model 2												
Combat Exposure	1.222	1.570	-0.307	2.751	0.743	1.602	-0.169	1.655	-	-	-	-
Marriage Quality	-1.786**	-2.387	-3.254	-0.319	-1.948***	-4.584	-2.781	-1.115	-	-	-	-
Model 3—Interaction Variable	0.078	0.093	-1.585	1.741	-2.11	-.395	-1.272	0.851	-	-	-	-
Alcohol Use Problems												
Model 2												
Combat Exposure	0.022	0.332	-0.108	0.152	0.025	0.540	-0.066	0.117	-	-	-	-
Marriage Quality	-0.058	-0.733	-0.220	0.104	-0.079	-1.803	-0.166	0.007	-	-	-	-
Model 3—Interaction Variable	0.003	0.040	-0.146	0.152	-0.041	-0.795	-0.144	0.061	-	-	-	-

1 – Table only shows results of Model 2 and Model 3 for each analysis run on each dependent variable; Model 1 included covariates (age, gender, and rank)
2 – Analyses were not run on Officers/Warrant Officers due to low sample size
**p < 0.05; ***p < 0.01

DISCUSSION OF THE FINDINGS

The study's first two hypotheses were that behavioral health outcomes would be predicted by combat exposure and marriage quality. For each HMR model, both combat exposure and marriage quality were found to predict posttraumatic stress symptoms and depressive symptoms at both Time 1 and Time 2. Marriage quality, and not combat exposure, predicted alcohol use problems at Time 2. These findings partially support the literature, which identifies a relationship between reports of higher combat exposures/experiences and reports of higher behavioral health symptoms or concerns. By contrast, this study also demonstrated an inverse relationship between marriage quality and behavioral health outcomes, where higher marriage quality scores predicted lower reported symptoms of posttraumatic stress, depression, and alcohol use problems. An additional observation results from a comparison of the b values of the marriage quality scores with reported combat exposure scores; marriage quality had higher predictability of behavioral health outcomes at Time 2 compared to Time 1. This suggests that, over time (approximately three months for this study), social supports such as marriage quality have the ability to serve as a buffer against behavioral health symptoms.

As previously discussed, the results found that marriage quality predicted alcohol use problems, where combat exposure was not predictive. Potential reasons for this finding are that there are other or better predictors to alcohol use problems (i.e. unit climate) or participants underreported problematic use in fear of stigma. Additional, alcohol use problems were measured only by problematic behaviors (need to cut down and used more than intended), compared to various behaviors and symptoms used to define the other two behavioral health outcomes. Last, alcohol is often used as a means to self-medicate to manage symptoms that are often experienced with other behavioral health conditions, such as problematic stress and depression.

Unexpected findings for this study are the results of the HMR analyses by rank for posttraumatic stress symptoms and depressive symptoms at Time 2. Marriage quality was found to predict posttraumatic stress symptoms and depressive symptoms for Junior Enlisted and Senior NCOs. Combat exposure was only a predictor for posttraumatic stress symptoms for Senior NCOs. According to this study's findings, understanding how combat exposure and marriage quality influences or predicts posttraumatic stress symptoms and depressive symptoms is potential significant to the enlisted ranks.

The third hypothesis predicted that marriage quality would moderate the relationship between combat exposure and behavioral health outcomes, which was not supported by this study. None of the HMR models were found to be statistically significant for this interaction effect. This is not to say that neither social support nor marriage quality can serve as a buffer against high levels of combat exposure; however, for this study, the analyses did not support rejecting the null hypothesis for any of the dependent variables. There can be various reasons for this outcome, such as the study design and the decision not to measure or to incorporate other relevant factors in the study. An important point to consider is that the proposed hypothesis is wrong in that marriage quality does not moderate the relationship between combat exposure and behavioral health outcomes. This study did not fully support all three hypotheses but partially supports the literature on the relationship between combat exposure and behavioral health symptoms, as well as the relationship between social supports and behavioral health symptoms.

SUMMARY

The focus of this chapter was to outline the findings and to determine if the results supported the study's hypotheses. The findings did not support the third hypothesis, as none of the

models were statistically significant concerning the ability of marriage quality to moderate the relationship between combat exposure and behavioral health symptoms. The moderating variable did not significantly contribute, whereas posttraumatic stress symptoms and depressive symptoms were predictive by the independent variables, which result supports hypotheses one and two. This chapter also summarized the sample characteristics for this study by comparing them to both the population of the WRAIR study and the results of the paired-sample t-tests between the scores from Time 1 to Time 2. The next chapter will provide an overview of the study, including its limitations and implications for social work policy and practice, as well as its recommendations for future research.

Chapter 5

SUMMARY

This chapter will provide a summary of the study and an application of the findings and results. The first section will offer an overview of the study and its impact on the current literature. Next will be a discussion on implications for policy and practice. The chapter will conclude with a discussion of the study's limitations and recommendations for future research.

STUDY OVERVIEW

With a nation that has been engaged in the War on Terrorism and its service members being continuously deployed, studies have found that roughly 20% of returning service members develop behavioral health problems as result of their combat experiences during deployment. This number jumps an additional 10% in the three to six months following deployment. These negative outcomes can often impact the service member, both occupationally and socially. Behavioral health problems that result from combat have been found to cause relationship problems between the service member and their spouse and children. The reintegration period immediately after the deployment is difficult for many military families; this period becomes more complicated when the service member attempts to cope with traumatic deployment experiences and behavioral health concerns. Oftentimes, the service member isolates themselves from the family to avoid burdening the family with their problems, or the family separate themselves from the service member due to their uncertainty about how to provide support. Behavioral health problems not only interfere with successful post-deployment adjustment for the service member but can also negatively impact family members. A service member's behavioral health symptoms have been linked to spousal and parental relationship problems; similar behavioral health symptoms can be experienced by the

family members. By contrast, social supports have been proven to serve as a buffer against behavioral health conditions by either preventing these conditions or supporting recovery from them. Research has linked strong family support and healthy intimate relationships to positive reintegration following a deployment and to a decrease in behavioral health symptoms. Military deployments and combat experiences undoubtedly impact both service members and their families and require these people to develop a new normal as part of the reintegration process. Through the lens of family systems theory, the post-deployment adjustment for the military family will be influenced by combat exposure and the level of the family's functioning.

One of this study's research questions asks if family support serves as a buffer against the development of behavioral health symptoms following a deployment for service members exposed to significant combat experiences. The study hypothesized that service members who reported higher scores of marriage quality would moderate the relationship between combat exposure and behavioral health symptoms during post-deployment adjustment. The study did not support this hypothesis, though some of the HMR models did support the literature asserting that combat exposure and marriage quality are predictors of behavioral health outcomes.

IMPACT ON THE CURRENT LITERATURE

The hope for the primary analyses was to produce a statistically significant model, in which marriage quality moderated the behavioral health outcomes for service members who reported high levels of combat exposure. A statistically significant interaction effect with marriage quality and combat exposure was not found, but, independently, these two variables were statistically significant for posttraumatic stress symptoms and depressive symptoms at both Time 1 and Time 2. Marriage quality was statistically significant for predicting alcohol use problems in the HMR at

Time 2. There was a positive relationship between combat exposure and both posttraumatic stress symptoms and depressive symptoms, as well as a negative relationship between high marriage quality scores and the same dependent variables. These findings support the current literature, which poses two claims: (1) that combat-exposed service members are vulnerable to developing behavioral health symptoms and (2) that intimate relationships serve as a buffer against negative behavioral health outcomes.

The findings reveal differences in the amount of predictability between the two independent variables, posttraumatic stress and depressive symptoms, at Time 1 compared to Time 2. Marriage quality scores were more predictive of behavioral health outcomes at Time 2, compared to reported combat exposure, which was more predictive at Time 1. This observation supports scholarly findings that strong intimate relationships can provide the needed support to diminish the potential lasting negative effects of combat exposure by aiding healthy post-deployment adjustment.

Additionally, the findings demonstrate a better understanding of the relationship between combat exposure and marriage quality by rank and the abilities of each rank category to predict behavioral health symptoms. Combat exposure was only statistically significant in predicting posttraumatic stress symptoms for Senior NCOs, compared to Junior Enlisted. Marriage quality predicted posttraumatic stress symptoms and depressive symptoms for both Junior Enlisted and Senior NCOs. These results suggest that the recognition that combat exposure and/or marriage quality are predictors of posttraumatic stress symptoms and depressive symptoms is relevant to the enlisted population. This study supports literature that explains how behavioral health outcomes are predicted by service members who report high levels of combat exposure and

marriage quality and a better understanding as the relationship between posttraumatic stress and rank.

IMPLICATIONS FOR SOCIAL WORK POLICY AND PRACTICE

The findings of this study may impact the field of social work, specifically, areas devoted to treating the military population. The study continues to advocate for the importance of understanding the impact of combat exposure on service members and the social support required for their successful reintegration. Additionally, it highlights the role that spouses play in mitigating negative behavioral health outcomes and encouraging successful post-deployment adjustments. The Army can use these findings to continue evaluating and assessing current policies that provide guidance about the implementation of prevention, education, and clinical treatment services that military families receive throughout the deployment cycle.

Policy. The Army, as well as the other Department of Defense agencies, provides guidance and direction through written directives, regulations, policies, and other manuals. These regulations and policies serve as the driving force for the implementation of all behavioral health programs and interventions that support service members and military families. A major priority for the Army is to provide the best clinical treatment and interventions to its beneficiaries, which requires ongoing policy assessments and research to better understand the impact and consequences of serving in the military and how to best meet these needs.

This study supports the continued use of policies and regulations that implement best practices in preventing, screening/assessing, and treating for the potential negative outcomes of combat deployments for service members, and suggests that policies include a specific area of focus including screening for quality of social and family supports. The known relationship between combat exposure and the development of behavioral health symptoms makes it imperative

that the Army continues their policy of routinely screening the mental health of its service members following deployments. The current policy or standard is that service members are screened prior to, during, and at three points within the year following deployment. In addition, it is normal policy and practice that, at most medical appointments, service members are screened with similar measures that were used in this study and the original study to inquire about their thoughts of self-harm, alcohol use, and symptoms of posttraumatic stress and depression. If there is a positive screen, then appropriate education, resources, and treatment services are provided to the patient, based on the severity of the screening scores. This study suggests that the Senior NCOs population is of particular interest to those who create, modify, and update policies as posttraumatic stress symptoms and depressive symptoms are predicted for this population by combat exposure and marriage quality compared to Junior Enlisted (marriage quality only) and Officers/Warrant Officers.

The positive influence that social supports such as marriage quality have upon the development of behavioral health symptoms or recovery from such symptoms can inform updates to policies that mandate the screenings; such updates should inquire specifically about the patient's social and family support. Then, based on the level of concern for the patient, they can be provided with education, resources, and treatment services to bolster their social supports. These screening policies and practices should not just focus on service members and their overall health, but they should also include family members, who must be screened at routine opportunities (medical appointments, part of redeployment/reintegration processes, etc.) and afforded similar education and treatment opportunities.

Practice. In this study, policy implications, including considerations and recommendations, are closely tied to practical implications. Two examples of the close

relationship between policy and practice include the aforementioned screening opportunities and the Army's current transformation as it integrates treatment services and programs. There are a variety of education, prevention, and treatment services offered to service members and military families. Historically, many of these services, albeit appropriate for some issues, are offered with a siloed approach that focuses on individual concerns or diagnoses. In recent years, behavioral health services and treatments have modified their approach by integrating programs that allow practitioners to treat the entire patient rather than limiting treatment to a single diagnosis or concern. A specific example concerns substance use issues, which are no longer treated at a specialty substance use clinic, but rather in outpatient behavioral health clinics, where service members could also receive treatment for trauma, depressive and anxiety symptoms, and other behavioral health conditions. These two clinics or programs have been integrated, and the service member is now treated holistically, including their comorbid symptoms and behaviors. This same concept or philosophy needs to be adopted by treating the family as a whole, rather than separately treating the service member experiencing symptoms of posttraumatic stress, the couple having intimacy and relationship issues, or the child experiencing behavioral and academic problems.

There is a reasonable chance that these symptoms are intertwined and can thus be addressed through family, couple, and group therapy modalities. Deployments not only impact the service member, but are also experienced by the entire family, resulting in changes (good or bad) to roles, rules, and norms. In the event that these changes negatively impact the family, a holistic approach to treating and supporting the entire family needs to be utilized. Regardless of the point of entry into or the reason for treatment, if the assessment acknowledges that the presenting problems would be best treated from a holistic approach, then that clinic should have the "freedom" to provide a holistic modality of treatment. Current treatment programs are implemented with an

individual patient in mind, and family members are often considered as collateral during the treatment process, rather than being fully incorporated into the process. Research and ongoing studies have shown the efficacy of treating families and couples by using family therapy, group therapy, and couples therapy.

Education efforts is another area that has practice implications, because education can be provided in various clinical and non-clinical settings to normalize the potential negative impacts of combat deployments. This was a primary focus of the original WRAIR, which investigated the effectiveness of multiple debriefing interventions, which were utilized immediately following the deployment, in improving support for the post-deployment adjustment of service members. Similar education interventions have been adapted to provide support and education to family members; such interventions have been offered throughout the deployment cycle to both service members and family members. Generally, service members are required to be attended these debriefs before, during, and after deployments. Education opportunities are often offered to family members at points of time similar to those of service members, but the family's attendance cannot be mandated. Continued practice efforts can be offered to both service members and family members to help them better understand the impact of deployments; additional efforts should focus on the development and implementation of practices that support building on and improving family quality and functioning. A particular time to focus on supporting military families would be to over education and training opportunities three to four months post-deployment building on and supporting their reintegration efforts. Focusing on building stronger family relationships and functioning has the additional benefit of military families being better equipped to adjustment positively to the stressors of deployment separation and reintegration.

In cases where the deployment and post-deployment adjustment requires clinical support and treatment, programs and clinician efforts should focus on supporting the entire family. Generally, clinical services for military families are in the form of individual or group therapy, with the occasional couples therapy. If family therapy is offered, it occurs with one or multiple children, who are the center of treatment. The traditional clinical support for military families does not generally utilize family therapy as a treatment modality to address the concerns that often develop during deployment and reintegration.

STUDY LIMITATIONS

This study has a few limitations in addition to those previously mentioned, which included 1) a secondary data analysis method where the questionnaire was designed to support the original study and not this current study, 2) the use of self-report questionnaires with concerns of interpretation, underreporting, and over-reporting, 3) missing data, and 4) modified measures. A significant limitation in this study is that the original study was an intervention study, used to determine which early treatment interventions support post-deployment adjustment and mitigate or decrease behavioral health symptoms. These interventions may have potentially influenced and directly affected the outcome of this study. This study did not find that marriage quality is a moderator on the relationship between combat exposure and behavioral health symptoms, in which the achieved decline in reported symptoms is better explained by interventions or other factors not included in this study.

There are inherent problems in using a secondary data analysis approach. The primary limitation in the current study is that its research questions did not align with the specific aims of the original study. The purpose of the original study was to assess different post-deployment

debriefing interventions to determine which ones would decrease behavioral health symptoms. The current study did attempt to examine relationships or factors that impacted behavioral health outcomes, but it did so through understanding the relationships by utilizing different variables or models.

The surveys used in the original study did collect data about various topics or items outside the scope of the original study's research, and subsequent studies have been conducted on some of these items. An example of additional data collected is the service member's perspective on their family's functioning and quality (marital status, number of children, and impact of deployment on family members); a portion of these items served as key variables in this study.

In the surveys for the original study, the measures or items used may not have provided a true representation of the desired constructs for this current study. A couple of examples include the measures used for marriage quality and alcohol use problems. The four items used in this current study to operationalize marriage quality come from a measure that has good face validity and good reliability (Cronbach's Alpha: Literature – 0.944, Time 1 – 0.975, and Time 2 – 0.967). The concern in using this measure for this study is that the measure assesses marriage quality at Time 1 and Time 2 but does not directly tie or inquire how the deployment or combat exposure impacted the participants' responses to the marriage quality measure. It is important to remember that although marriage quality did not moderate the relationship between combat exposure and behavioral health symptoms, marriage quality was a predictor for posttraumatic stress symptoms, depressive symptoms, and alcohol use symptoms. Second, to assess alcohol use problems, the TICS was incorporated into the surveys of the original study; although it has been found to have good internal consistency in other research and clinical settings, the reliability for this measure (α = 0.589) was assessed as poor for this study. It is recommended that future research that attempts

to use marriage quality or alcohol use problems as variables incorporate measures designed to accurately measure the desired constructs for the particular study.

Utilizing self-report questionnaires and missing data are two additional limitations that were previously discussed as relevant to this study. Self-report questionnaires are subject to the interpretation of study participants, despite the efforts taken by questionnaire creators to design a well-constructed instrument that both captures data on desired constructs and supports the research question. Additionally, one must consider the concern of over- or underreporting needs, which may result from stigma, social undesirability, or perceived benefits. The concern of stigma is relevant to this study's population, as the stigma of seeking behavioral health services remains a prevalent issue in the military.

The findings of any study, including this one, must be considered with caution when there are missing data. There are pros and cons to every method that can be used to manage missing data. Cases can be completely or partially excluded, thus having an impact on the total number of participants that are included in the data analysis. For this study, multiple imputation was selected to handle the missing data, because more than 5% of the cases were found to be missing data in some of the variables. Using this approach creates a complete data set that can be analyzed for a particular study or research; however, different data sets are created each time the imputation process is completed, making it difficult to replicate in future analyses and studies.

FUTURE DIRECTIONS FOR RESEARCH

Future research recommendations should start with developing methodologies and data analysis plans that address the listed study limitations. This would aid the understanding of the relationship between combat exposure and marriage quality and their impact on behavioral health outcomes, as well as the understanding of marriage quality's moderating effect on the relationship

between combat exposure and behavioral health symptoms. Future studies that continue to look at these relationships should consider a longitudinal design that captures individual and family functioning and quality prior to the deployment, which can serve as a baseline for measuring the impact of deployment and combat exposure on post-deployment adjustment.

Research asserts that social and family supports, such as spousal relationships, are beneficial for mitigating the development of or recovery from behavioral health concerns, but future research should be designed with understanding the benefits of social support on behavioral health outcomes as a primary aim and not as a secondary data analysis. Such research would require the development and testing of a specific questionnaire that utilizes reliable and valid measures that capture data on the desired constructs. Additionally, consideration should be given to expanding the study's population by recruiting family members who are willing to participate in a study, either in a study of only family members or a study of both service members and members of their family. Getting the family members involved will provide a holistic perspective on the impact that combat exposure and/or social supports can have on behavioral health symptoms. A study might additionally consideration utilizing a mixed-method design, which could aid in developing a comprehensive understanding of the impact of combat exposed-service member have on families and successful reintegration. The current literature depicts the negative impacts that deployments can have on service members and on the whole family's post-deployment adjustment.

The inclusion of a qualitative element in the study can provide a more in-depth understanding of the quantitative results. Thus, the outcome of the study could provide better informed recommendations about the education, prevention, and treatment methods that support military families and address the potential negative outcomes of combat deployments.

Additionally, a study design that looks into the relationship between behavioral health outcomes, combat exposure, marriage quality, and the relevancy of rank could specifically focus on enlisted personnel and posttraumatic stress symptoms.

Last, to better understand the impact of combat exposure, future research efforts should question if particular types or clusters of combat experiences or exposure are more problematic than others. This study focused on combat exposure as a total sum score, but a future study could attempt to investigate a possible relationship between behavioral health outcomes and different factors connected to combat exposure. These findings, if significant, could recommend that efforts to modify policies and practices be tailored to specific units, service members, and military families with research-informed interventions (prevention, screenings, and treatment).

SUMMARY

In conclusion, the literature supports the assertion that combat-exposed veterans are at risk of reporting significant behavioral health symptoms following deployment, which symptoms can negatively impact the functioning level of their family. Posttraumatic stress symptoms, depressive symptoms, and problematic alcohol use has been linked to service members who return home from a complicated combat deployment. Additionally, the family members of these service members are then subject to a higher risk of experiencing similar symptoms and problematic behaviors. These factors can lead to difficulties as military families work to successfully reintegrate and create new, health family norms following the deployment. This study attempted to add to the literature by better understanding the roles that combat exposure and marriage quality play in behavioral health outcomes of service members returning from a combat deployment. Additionally, this study attempted to investigate whether or not marriage quality can moderate the known relationship between combat exposure and behavioral health symptoms.

This study partially supports and builds on the current literature and research by reporting similar findings, including the observation that significant combat exposure is linked to higher reported behavioral health symptoms in service members following a deployment. Additionally, this study added to the literature by strengthening the link that a supportive family/quality marriage is critical to reports of diminishing behavioral health concerns within the military population. The findings of this study can serve as a starting place for future research that might seek to better understand the influence that healthy marriages and relationships have on the behavioral health outcomes of combat-exposed veterans. By contrast, the study did not support the hypothesis that higher reported marriage quality would moderate the relationship between significant combat exposure and reported behavioral health symptoms. Future studies have the potential to lead to a better understanding of the impact that combat exposure and marriage quality have on behavioral health outcomes and to influence improvements in behavioral health and social work policies and practices within the military setting.

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