AN EXPLORATION OF MARITAL HEALTH AND STRESS AMONG MILITARY COUPLES

by

Meghan H. Lacks

April, 2013

Director of Thesis: Angela L. Lamson, Ph.D.

DEPARTMENT OF CHILD DEVELOPMENT AND FAMILY RELATIONS

There are approximately 1.5 million active duty service members in today's military (Department of Defense [DoD], 2010) and approximately 726,000 (56.4%) of these individuals are married (DoD, 2010). Although the military offers benefits for married personnel, military couples also experience many hardships due to the demands from being in the armed forces (Laser & Stephens, 2011) and the stressors and challenges of military life may leave military members and their spouses more at risk for marital strain. The factors that garner the most attention for disruption and positive outcomes in relationships are the presence and process of deployment, changes in rank, and marital and physiological stress. The present study examines how factors such as deployment, rank, and length of time in the service, influence military personnel, their spouse, and their marital health (marital satisfaction, adjustment, and quality). This study took place within a family medicine practice on an Air Force base in the southeastern United States and data was collected from patients and their spouses using self-report measures and biomarkers (e.g., blood pressure and heart rate variability). Correlations and regression analyses were run to examine significant relationships between deployment, rank, length of time in the service, physiological stress and marital satisfaction, adjustment, and quality. Ultimately, the present study attempts to aid evidence based policy to support military couples since the

deterioration of marital relationships has the ability to impact the performance of military personnel, which could ultimately have an impact on national security.

AN EXPLORATION OF MARITAL HEALTH AND STRESS AMONG MILITARY COUPLES

A Thesis

Presented To the Faculty of the Department of Child Development and Family Relations

East Carolina University

In Partial Fulfillment of the Requirements for the Degree

Master of Science in Marriage and Family Therapy

by

Meghan H. Lacks, M.S.

April, 2013

AN EXPLORATION OF MARITAL HEALTH

AND STRESS AMONG MILITARY COUPLES

by

Meghan H. Lacks

April, 2013

APPROVED BY:

DIRECTOR OF THESIS: _____
Angela Lamson, PhD

COMMITTEE MEMBER: _____
Andrada Ivanescu, PhD

COMMITTEE MEMBER: _____
Carmen, Russoniello, PhD

COMMITTEE MEMBER: _____
Mark White, PhD

INTERIM CHAIR OF THE DEPARTMENT OF CHILD DEVELOPMENT AND FAMILY RELATIONS:

_____
Sharon Ballard, PhD

DEAN OF THE
GRADUATE SCHOOL: _____
Paul J. Gemperline, PhD

ACKNOWLEDGMENTS

First, I would like to thank all of the men and women that serve in the military, domestic and abroad, for their courage, devotion, and selflessness. Words cannot express how thankful I am for the sacrifice that you and your families make on a daily basis. This project is one way for me to try to support you and show gratitude for all you do.

Second, I would like to thank the medical providers, technicians, and staff at Seymour Johnson Air Force base for supporting, encouraging, and allowing this project to continue. You all have been more than accommodating and accepting of our presence at the medical clinic and this project would not have been successful without your unconditional support.

Third, I would like to graciously thank my chair, advisor, supervisor, and mentor, Dr. Angela Lamson for teaching, supporting, and guiding me through this process. Your unconditional love for the "dynamic trio," your continued encouragement when I was "almost there," and the enthusiasm you shared regarding this project continued to motivate me and to keep me going during sleepless nights! I have grown immensely as a clinician, researcher, and writer thanks to your expertise and I cannot thank you enough for allowing me this opportunity.

Fourth, I would like to thank Andrada Ivanescu, Mark White, and Carmen Russoniello for taking the time to support and guide me through this process. The knowledge you all possess is humbling and this project would not have been successful if not for your hard work and support.

Fifth, I would like to thank God for being a source of comfort, strength, and peace as I pushed through this project. I would also like to thank my husband, Whit, for spending countless hours with me at the Redditt House Research Academy, making me snacks for late nights, and

being patient with me during the writing process. You were my biggest cheerleader throughout this process and I truly appreciate every thoughtful gesture you put forth during this time.

Further, I would like to thank my parents, Josef and Shannon Hohn and David and Shannon Lewis, for continuously calling to check on me and providing unconditional love, support, and admiration for my work. Lastly, I would like to thank Amelia Muse, Lisa Buchner, Rola Aamar, Sara Herrity, and DeAnna Coughlin for answering questions, listening to my concerns, and baking delicious treats to keep me encouraged throughout this process. Each one of you has been instrumental in my success of this project.

This research was conducted by East Carolina University and is made possible by a cooperative agreement that was awarded and administered by the U.S. Army Medical Research & Materiel Command (USAMRMC) and the Telemedicine & Advanced Technology Research Center (TATRC), at Fort Detrick, MD, under Contract Number: W81XWH1120221. The views, opinions and/or findings contained in this thesis are those of the author(s)/East Carolina University and do not necessarily reflect the views of the Department of Defense and should not be construed as an official DoD/Army position, policy or decision unless so designated by other documentation.

Table of Contents

LIST OF TABLES

CHAPTER FOUR

LIST OF FIGURES

CHAPTER ONE

PREFACE

I have always had a research interest for military families because my grandfathers, father, and brother have all served. When I came into the East Carolina University Marriage and Family Therapy Program, I knew that I wanted to do a thesis because of my passion for research. However, I did not know that my two passions would meet so seamlessly my first year in graduate school. Being able to focus my thesis on one of my biggest research passions has been a wonderful journey! Not only did I gain incredible research experience at the military base, but I got to meet wonderful people in the process. The staff at Seymour Johnson Air Force base became a part of my family and this project would not have been as fulfilling if not for their gracious hearts and their support of research.

The past year and a half has been one of late nights, early mornings, frustrations, excitement, and learning, learning, learning! I have learned more about myself during this experience than I ever thought possible and it ignited my passion for working with military families; not only because of the stress and demands put on personnel, but because the hope, courage, and determination they possess is inspiring. Further, this process allowed me to be witness to the amount of love and support surrounding me. My husband, family, and cohort members have been the most loyal, caring, and understandable people that I could have asked for during this process. Lastly, Dr. Angela Lamson and my committee have been extreme sources of motivation and inspiration as educators, researchers, and clinicians.

As this project sparked a fire for my interest in working with military couples, I pray that this is only the beginning of my research career and that I continue to build off the hard work that was put forth with this project.

CHAPTER ONE: INTRODUCTION

Approximately half (48.8%) of Americans over the age of 15 are married (U.S. Census Bureau, 2010). The benefits of getting married are plentiful, in fact, saying "I do" grants immediate access to approximately 1,100 federal benefits (Freedom to Marry, 2012). The benefits of staying married are also abundant, with a higher quality of life that includes an increase in physical and mental health and emotional and physical satisfaction (Waite & Lehrer, 2003). Further, married couples experience longer lives (Waite & Gallagher, 2000), higher life satisfaction (Waite, 2000), and greater economic security (Schwartz, 2005).

Although the benefits of marriage are reflected in several dimensions of life, all couples also experience stressors that impact their daily functioning. The most common stressors for married couples are associated with work and financial difficulties (Neff & Broady, 2011). Just as marriage has positive benefits on an individual's functioning, marital stress can negatively impact individual functioning (Burman & Margolin, 1992). For example, when compared to nondistressed couples, distressed couples exhibit poorer overall health outcomes (Burman & Margolin, 1992). Along with that, there is research to support the notion that married couples' daily work stress has a detrimental impact on their home life (Schulz, Cowan, Cowan, & Brennan, 2004). While all couples experience turbulent moments in their relationship, military couples encounter unique difficulties and exceptional strengths through military life beyond those often managed in civilian partnerships (Griffin & Morgan, 1988).

There are approximately 1.5 million active duty service members in today's military (Department of Defense [DoD], 2010) and approximately 726,000 (56.4%) of these individuals are married (DoD, 2010). This number does not include the 1.1 million Reservists and their families (DoD, 2010). Also, the Air Force has consistently had a higher proportion of married

service members (59.2%) than any other branch, whereas, the Marine Corps has the lowest percentage (48.8%) of married personnel (DoD, 2010). Along with that, for enlisted members, Air Force members have the lowest divorce rate and Navy personnel have the highest rate of divorce (DoD, 2010). Further, divorce rates for officers are lowest for Navy service members and highest for Army personnel (DoD, 2010).

The military is a voluntary-only force and it is one of the largest employers in the US that provides specific benefits to personnel for being married (Lemmon, Whyman, & Teachman, 2009) with the intention of ensuring job retention. Benefits allotted to active-duty married military personnel include a monthly stipend for housing that is based on the number of dependents within the family, assistance in finding employment for spouses, pay supplements during deployment, and child care (Lemmon et al., 2009). Although the military offers benefits for married personnel, military couples also experience many hardships due to the demands from being in the armed forces (Laser & Stephens, 2011).

Geographic mobility, periodic separations, and long and unpredictable duty hours (Burrell, 2006) are just a few of the elements that influence military marriages. While these elements may be embraced as strengths in some marriages, others are caught up in the challenges aligned with military life, perhaps more than ever, due to the conflicts in Iraq and Afghanistan (Allen, Rhoades, Stanley, Markman, 2010; de Burgh, White, Fear, Iversen, 2011; Karney & Crown, 2007). In fact, military personnel who have deployed to Operation Iraqi Freedom (OIF) or Operation Enduring Freedom (OEF) have reported higher rates of stress in their family than deployments to other areas (Bray et al., 2010). As mentioned previously, civilian married couples also experience stressful events and times during their marriage, but the stressors and challenges of military life may leave military members and their spouses more at risk for marital

strain. In fact, wives of military members have even reported that military stressors interfere with their ability to effectively maintain their marital relationship and they reported that they did not expect they would have the same relational problems if they were not involved in the military (Karney & Crown, 2007). In addition, researchers have found that the demands of military life often alter the positive bonding, including closeness and intimacy, needed for a healthy marriage due to periodic separations (Markman, Rhoades, Stanley, Ragan, & Whitton, 2010; Rosen & Durand, 2000).

Periodic separations can affect the positive connections spouses experience in successful marriages (Markman et al., 2010). While deployment often gets negative attention for its influence on relationships, researchers have found that spouses who were married to military personnel and had been deployed during Operation Desert Storm reported greater closeness after the deployment (Rosen, Durand, Westhuis, & Teitelbaum, 1995). Perhaps the factors that garner the most attention for disruption and positive outcomes in relationships are the presence and process of deployment, changes in rank, and marital and physiological stress.

Factors That Influence Military Marriages

Deployment cycles have gotten a lot of attention for better (Rosen et al., 1995) or worse (Duckworth, 2009; Hosek, Kavanagh & Miller, 2006) in the lives of military couples. Deployments tend to have a devastating effect on relationships because of the lack of communication, financial concerns, and the anxiety that accompanies worrying about loved ones who are in combat (Karney & Crown, 2007). Further, the DoD reported that military personnel who have deployed in the last three years showed an increase in work and family stress when compared to non-deployed personnel (Bray et al., 2006). For every branch of the military, family stress is significantly higher for personnel who had deployed than personnel who had not

deployed (Bray et al., 2010). However, it is possible that after a certain number of deployments military spouses adapt to the stressors brought on from deploying. For example, Karney and Crown (2007) found that for every branch except the Air Force, the longer the military spouse was deployed, the more stable their relationship.

Not only do deployments influence military personnel and their spouses, but rank and length of time in the service also have the ability to impact the relationship. The military personnel's length of time in the service coincides with their rank (DoD, 2010), therefore, if rank impacts the marriage, time in service may also affect the relationship. With regard to rank, approximately 17% of active duty personnel are officers and around 83% are enlisted members (DoD, 2010). In 2010, mid-level or senior officers (O4-O10) were more likely to be married than junior officers (O1-O3). In addition, when examining the military as a whole (inclusive of all branches), 69.9% of officers are married and 53.7% of enlisted members are married (DoD, 2010).

Further, military pay and benefits for junior to midlevel enlisted members are relatively low (Twiss & Martin, 1999). Pay could influence the military personnel's marital relationship because researchers have found that economic strain is related to psychological distress, which in turn decreases marital adjustment (Kinnunen & Feldt, 2004). Further, military personnel have reported that financial management is a major source of stress (DoD, 2011). In addition to lower pay, lower ranked military personnel are more likely to experience stress from work impacting home life due to having less power within their jobs and less economic resources (Allen et al., 2011). Thus, military personnel with lower rank experience relocations more frequently than high ranked personnel, adding to their financial stress due to lower pay and the costs associated with moving. Relocations are due to the training assignments essential in the beginning stages of

a personnel's career (General Accounting Office [GAO], 2001) yet simultaneously alter support systems and job security for spouses. Housing allowances for military members are also determined by rank and could impact the marriage, since housing is an important aspect in quality of life and quality housing increases overall quality of life (Ahmed et al., 2005). The compilation of deployments, lower rank, and economic strain can all serve as a trigger toward a conflictual marriage.

Marriages are impacted by stressful events and all of the conditions mentioned above have the ability to impact the stress levels of the military personnel, spouse, and the marital relationship (Langer, Lawrence & Barry, 2008). Military personnel frequently report sources of stress beyond those aligned with a deployment, including conflicts between military and family responsibilities (Bray et al., 2010). While military events can trigger stress at home, stress in the home can also have a negative effect on military life. Familial stress is a particular concern for the military, because it can interfere with mission readiness and job performance (Bray et al., 2010). The military's concern about reducing stress has become such an important concern that the DoD created family centers for military personnel to aid in balancing the stress from personal relationships and the military lifestyle (Bray et al., 2010). Peripheral stressors, similar to the ones mentioned above, not only impact behavior, but there are also physiological responses that happen within our bodies during times of stress (Segerstrom & Miller, 2004). Though very complex, these responses are often known as "fight or flight" mechanisms and have the ability to make changes to the immune system (Segerstrom & Miller, 2004).

Stress has the ability to influence mental, physical, and relational functioning (Gunlicks-Stoesse & Powers, 2009). Further, relational stress is related to physiological functioning and if physiological stress levels are high, there is a greater risk for poor mental and physical health

(Gunlicks-Stoesse & Powers, 2009). Physiological responses have an influence on how couples regulate the stressors within their relationship (Gunlicks-Stoesse & Powers, 2009). If heightened stress levels within a relationship are not managed, the body's physiological response (such as elevated heart rate) to stress could adapt and make changes in the immune system, thereby making it more difficult for individuals to recover from stressors in the future (Gunlicks-Stoesse & Powers, 2009).

This complex dynamic is reflected in general systems theory (von Bertalanffy, 1968) such that a change in one thing, experience, or person influences other things, experiences, and people. Due to the interconnectedness between specific factors in military life, such as, rank, deployment, and the length of time in the service, and marital functioning and stress, the combination of these factors may influence stress and stress reciprocally influences functioning. All of these factors together then can affect partners of a relationship in unique ways, or with even greater complexity can alter the trajectory of a marriage.

Theory

The foundation that grounds this study is general systems theory. This theory originated from mathematics and science in order to understand and find solutions to problems in an efficient manner (von Bertalanffy, 1968) and refers to the relatedness of two or more parts and how each part influences or changes every other part (Hanson, 1995). These parts form a system and each action, or lack thereof, influences the entire system; the influence can be intentional, or unpredictable (Hanson, 1995). This theory also refers to the examining of patterns within systems over a long period of time and understanding the complex interactions within systems and the complexity of change within a system (Hanson, 1995).

Systems theory is appropriate for this thesis because of the connection between all of the variables being examined, as shown in Figure 1. For example, as previously discussed, factors of military life (rank, deployment, length of time in the service) have the ability to influence marital health. In addition, the stressors and/or benefits from rank, deployment, and time in the service influence stress response and stress response also has the ability to influence each of these factors. Time in the service may be shorter for military personnel with irregular stress responses because the stressors from military life could influence personnel to leave or stay in the service. Furthermore, stress responses can influence rank because of how stress impacts the overall functioning of military personnel (health and work performance). Therefore, personnel may not get promoted if they are unable to manage all of the duties that coincide with higher rank, and the number of deployments may influence or be influenced by their stress response. If, for example, military personnel have ill-health that is exacerbated by stress, they may not be deployable. Also, stress response and marital health may influence one another because poor stress response may affect how couples handle conflict and feeling stressed can also alter how partners relate to one another.

Lastly, a stress response, (e.g., heart rate variability [HRV]) in particular, may have a moderating effect in the relationship of military life factors and marital health, thus strengthening or weakening the relationship between rank, deployment, time in the service and marital health . HRV is used to measure the autonomic nervous system. More specifically, it measures the relaxation and stress responses from the sympathetic and parasympathetic branches by measuring the interval of times between heart beats (Combatalade, 2010). The heart's beating rate varies moment to moment, and is influenced by many factors, such as physical health (Combatalade, 2010). Individuals' minimum to maximum heart rate range is indicative of their

level of health and can influence their ability to adapt to stressors; the normal range for a healthy individual at rest is between 50-70 beats per minute (HRVLive, 2009). There are three bands that are of importance within the HRV frequency spectrum. These bands are the Very Low Frequency (VLF), Low Frequency (LF), and High Frequency (HF) (Combatalade, 2010). The variability within one's heart beat is seen as strength in order for individuals to be able to adapt to life changes or stressors. By assessing the HRV scores for individuals, information can be gathered about how their body is adapting to stressful experiences.

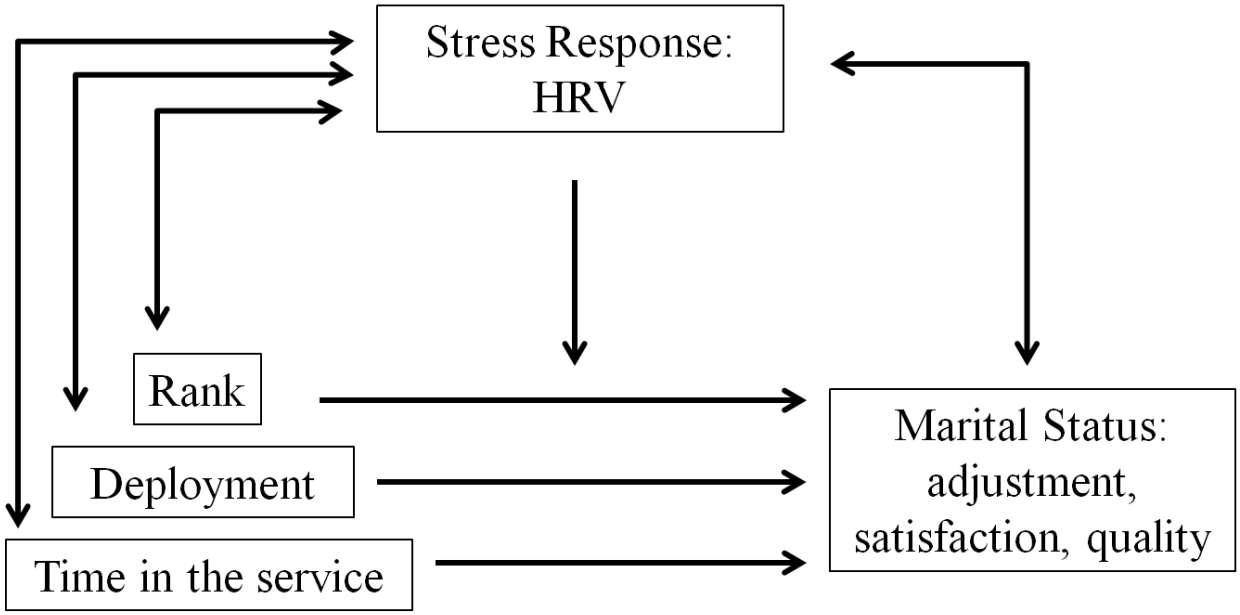

Figure 1. Conceptual Model.

Purpose

The purpose of this thesis is to examine how characteristics about military personnel and their spouse influence their marital health (marital satisfaction, adjustment, and quality). More specifically, the factors that pertain to this study are deployment, military personnel's rank, and their length of time in the service. My hypotheses for this study include:

1.) There will be a positive relationship between the number of deployments the military partner has experienced and the strength of marital health (quality, satisfaction, and adjustment).
2.) There will be a positive relationship between the years the military partner has been in the service and the strength of marital health (quality, satisfaction, and adjustment).
3.) There will be a positive relationship between the rank of the military personnel (E1-E9) and the strength of marital health (quality, satisfaction, and adjustment).
4.) Physiological stress as measured by heart rate variability (HRV) will have a moderating effect on hypotheses 1, 2, 3 and marital health.

Summary

The purpose of this thesis is to examine the general characteristics of military life (rank, deployments, and length of time in service) and how each is related to marital health.
The military is the nation's largest employer and over half of military personnel are married. With that being said, not only do the challenges of military life impact the military personnel, but also his or her spouse and the marital relationship. The deterioration of marital relationships has the ability to impact the performance of military personnel, which could ultimately have an impact on national security.

References

Ahmed, S., Sukar, A., Burgess, S., Ali, S., Darius, T., & Yeo, L. E. (2005). A study of Fort Sill military housing needs. Retrieved from http://www.lawtonok.org/qualityoflife/fort-sill-housing-needs.pdf

Allen, E. S., Rhoades, G. K., Stanley, S. M., & Markman, H. J. (2010). Hitting home: Relationships between recent deployment, posttraumatic stress symptoms, and marital functioning for Army couples. *Journal of Family Psychology, 24*(3), 280-288. doi:10.1037/a0019405

Allen, E. S., Rhoades, G. K., Stanley, S. M., & Markman, H. J. (2011). On the home front: Stress for recently deployed army couples. *Family Process, 50*(2), 235-247. doi:10.1111/j.1545-5300.2011.01357.x

Bray, R. M., Hourani, L.L., Olmstead, K. L., Witt, M., Brown, J. B., Pemberton, M. R.,… Hayden, H. (2006). *2005 Department of defense survey of health related behaviors among active duty military personnel: A component of the defense lifestyle assessment program. Research Triangle Park, NC*: RTI International.

Bray, R. M., Pemberton, M. R., Lane, M. E., Hourani, L. L., Mattiko, M. J., & Babeu, L. A. (2010). Substance use and mental health trends among U.S. military active duty personnel: Key findings from the 2008 DoD health behavior survey. *Military Medicine, 175*(6), 390-399. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=cmedm&AN=20572470&site=ehost-live

Burman, B., & Margolin, G.(1992). An analysis of the association between marital relationships and health problems: An interactional perspective. *Psychological Bulletin, 112*, 39-63. doi: 10.1037/0033-2909.112.1.39

Burrell, L. M., Adams, G. A., Durand, D. B., & Castro, C. (2006). The impact of military lifestyle demands on well-being, army, and family outcomes. *Armed Forces & Society, 33*(1), 43-58. doi:10.1177/0002764206288804

Combatalade, D.C. (2010). Basics of heart rate variability applied to psychophysiology. Retrieved from http://www.emfandhealth.com/HRVThoughtTechnology.pdf

de Burgh, H., White, C. J., Fear, N. T., & Iversen, A. C. (2011). The impact of deployment to Iraq or Afghanistan on partners and wives of military personnel. *International Review of Psychiatry, 23*(2), 192-200. doi:10.3109/09540261.2011.560144

Department of Defense (DoD) (2010). Demographics report. Retrieved from http://www.militaryhomefront.dod.mil//12038/Project%20Documents/MilitaryHOMEFRONT/Reports/2010_Demographics_Report.pdf

Department of Defense (DoD) (2011). Strengthening our military families: Meeting America's commitment. Retrieved from http://www.defense.gov/home/features/2011/0111_initiative/Strengthening_our_Military_January_2011.pdf

Duckworth, D. (2009). Affects of multiple deployments on families. United Sates of America War College (USAWC) Strategy Research Project. Carlisle Barracks: PA. Retrieved from http://www.dtic.mil/cgibin/GetTRDoc?Location=U2&doc=GetTRDoc.pdf&AD=ADA498029

Freedom to Marry (2012). Protections and responsibilities of marriage. Retrieved from http://www.freedomtomarry.org/pages/protections-and-responsibilities-of-marriage

General Accounting Office (GAO) (2001). Longer time between moves related to higher satisfaction and retention. Retrieved from http://www.gao.gov/new.items/d01841.pdf

Griffin, W. A., & Morgan, A. R. (1988). Conflict in maritally distressed military couples. *American Journal of Family Therapy, 16*(1), 14–22. doi: 10.1080/01926188808250703

Gunlicks-Stoessel, M. L., & Powers, S. I. (2009). Romantic partners' coping strategies and patterns of cortisol reactivity and recovery in response to relationship conflict. *Journal of Social & Clinical Psychology*, *28*(5), 630-649.

Hanson, B. G. (1995). *General systems theory beginning with wholes*. Philadelphia, PA: Taylor & Francis.

Hosek, J., Kavanagh, J., & Miller, L. (2006). *How deployments affect service members*. Santa Monica, CA: RAND Corporation and research on marriage and divorce in the military. Santa Monica, CA: RAND Corporation.

HRVLive! (2009). Biocom Technologies. Retrieved January 15, 2012, from http://www.biocomtech.com/products/hrvlive

Karney, B. R., & Crown, J. S. (2007). *Families under stress: An assessment of data, theory, and research on marriage and divorce in the military*. Santa Monica, CA: RAND Corporation.

Kinnunen, U., & Feldt, T. (2004). Economic stress and marital adjustment among couples: Analyses at the dyadic level. *European Journal of Social Psychology, 34*, 519-532. doi: 10.1002/ejsp.213

Langer, A., Lawrence, E., & Barry, R. A. (2008). Using a vulnerability-stress-adaptation framework to predict physical aggression trajectories in newlywed marriage. *Journal of Consulting and Clinical Psychology, 76*(5), 756-768. doi:10.1037/a0013254

Laser, J., & Stephens, P. (2011). Working with military families through deployment and beyond. *Clinical Social Work Journal*, *39*(1), 28-38. doi:10.1007/s10615-01003105

Lemmon, M., Whyman, M., & Teachman, J. (2009). Active-duty military service in the United States: Cohabiting unions and the transition to marriage. *Demographic Research, 20* (10), 195-208. Retrieved from http://ehis.ebscohost.com.jproxy.lib.ecu.edu/ehost/detail?vid=27&hid=4&sid=c09a7f1f71c64ccea8b4a3c6f2bb8627%40sessionmgr12&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#db=sih&AN=41021475

Markman, H. J., Rhoades, G. K., Stanley, S. M., Ragan, E. P., & Whitton, S. W. (2010). The premarital communication roots of marital distress and divorce: The first five years of marriage. *Journal of Family Psychology, 24*(3), 289-298. doi:10.1037/a0019481

Neff, L. A, & Broady, E. F. (2011). Stress resilience in early marriage: Can practice make perfect? *Journal of Personality and Social Psychology, 101*(5), 1050-67. doi:10.1037/a0023809

Rosen, L. N., & Durand, D. B. (2000). Coping with the unique demands of military family life. In J. Martin, L. Rosen, & L. Sparacino (Eds.). *The military family: A practice guide for human service providers* (pp. 55–72). Westport, CT: Praeger.

Rosen, L. N., Durand, D., Westhuis, D. J. & Teitelbaum, J. M. (1995). Marital adjustment of army spouses one year after Operation Desert Storm. *Journal of Applied Social Psychology, 25,* 677–692. doi: 10.1111/j.1559-1816.1995.tb01768.x

Schulz, M.S., Cowan, P. A., Cowan, C. P., & Brennan, R.T. (2004). Coming home upset: Gender, marital satisfaction, and the daily spillover of workday experience into couple interactions. *Journal of Family Psychology, 18*, 250–263. doi:10.1037/0893-3200.18.1.250

Schwartz, J. (2005). The socio-economic benefits of marriage: A review of recent evidence from the United States. *Economic Affairs, 25*(3), 45-51. doi: 10.1111/j.1468-0270.2005.00571.x

Segerstrom S. C., & Miller, G. E. (2004) Psychological stress and the human immune system: A meta-analytic study of 30 years of inquiry. *Psychological Bulletin,130* (4), 601–630. Retrieved from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1361287/?tool=pubmed

Twiss, P. C., & Martin, J. A. (1999). Conventional and military public housing for families. *Social Service Review, 73*(2), 240-260. Retrieved from http://www.jstor.org/discover/10.1086/514416?uid=3739776&uid=2129&uid=2&uid=70&uid=4&uid=3739256&sid=21100797600981

U. S. Census Bureau. (2010). American community survey. Retrieved from http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_10_1YR_S1201&prodType=table

von Bertalanffy, L. (1968). *General systems theory*. New York, NY: George Braziller.

Waite, L. J. (2000).Trends in men's and women's well-being in marriage. In: Waite, L., Bachrach, C., Hindin, M., Thomson, E., & Thornton, A. (Eds.), *The ties that bind: Perspectives on marriage and cohabitation (368-392).* New York, NY: Aldine de Gruyter.

Waite, L.J. & Gallagher, M. (2000). *The case for marriage: Why married people are happier, healthier, and better off financially*. New York, NY: Doubleday.

Waite, L. J., & Lehrer, E. L. (2003). The benefits from marriage and religion in the United States: A comparative analysis. *Population and Development Review, 29*(2), 255-276. Retrieved from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2614329/

CHAPTER TWO: LITERATURE REVIEW

Researchers have examined military conflict and its influence on relationships for decades (General Accounting Office [GAO], 2001; Karney & Crown, 2007; McCubbin, Dahl, Lester, Benson, & Robertson, 1976; Reed & Segal, 2000). Gaining knowledge about the well-being of military personnel and their spouses is pertinent for several reasons; military personnel are responsible for our national defense and the military's influence on relationships is a relevant concern because of the 1.5 million personnel that the military employs, more than half (56.4%) are married (Department of Defense [DoD], 2010). Further, 58.5% of active duty males and 45.7% of active duty females are married (DoD, 2012). Also, it is important to note that not all military marriages are made up of husbands as the military personnel and wives as civilians; 9.1% of married active duty, Reserve, and Guard are dual-military marriages (DoD, 2012). However, there is not consistent information on the percentage of couples where the husband is the civilian spouse and the wife is the military personnel.

With that being said, the well-being of military personnel and their relationships have become such an interest at the federal level that President Obama made the issue a priority in his national security policy (DoD, 2011). Addressing the needs of military personnel and their families is two-fold, because the well-being of the military family is reflected in the well-being of the services (DoD, 2011) and vice versa. Relevant themes for this literature review include discussions about the differences between past and recent wars, the experiences of each spouse in a military marriage, factors that influence service members and their spouses (e.g., deployments, rank, and length of time in service) and how the stress from military life shapes the experiences of military personnel and their spouse.

Past and Recent Conflicts

Researchers have studied the impact of war on service members for years, especially in relation to the recent conflicts, Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) (Makin-Byrd, Gifford, McCutcheon, & Glynn, 2011; Sautter, Armelie, Glynn, & Wielt, 2011). A vast amount of service members have had direct experience with these conflicts (1.9 million service members have been deployed for OEF/OIF), and military personnel's experience with wars has changed in recent years because of the differences between OEF/OIF and past wars (Institute of Medicine [IOM], 2010). Today, military personnel are more likely to be older (average ages for active duty enlisted personnel and officers are 27.3 and 34.7 years of age, respectively) (DoD, 2010), more likely to be married (69.9% of officers and 53.7% of enlisted personnel) (DoD, 2010), and more ethnically and racially diverse than the active duty military personnel from the Vietnam era (DoD, 2010). The demographics for our current service members are 70% white, 17% black or African American, 4.9% of other/unknown, 3.7% Asian, 1.7% Alaska Native or American Indian, and .6% native Hawaiian or other Pacific Islander) (DoD, 2010), whereas, the demographics of soldiers during Vietnam were 88.4% white, 10.6% black, and 1% other races (World History Project, 2007).

Along with that, OEF and OIF were the first multi-year operations to utilize volunteer-only service members (Makin-Byrd et al., 2011). Since these conflicts have employed such a substantial number of active-duty, all-volunteer personnel, military personnel and family members are experiencing distinct hardships compared to the civilian population (Congressional Budget Office [CBO], 2007). An all-volunteer-only force means that military personnel are not drafted to be in the military, but choose to join (CBO, 2007). Along with that, recent conflicts have required more frequent and longer deployments; almost half of service members have been

deployed at least twice (IOM, 2010). Also, the OEF and OIF conflicts involved tactics such as improvised explosive devices (IEDs), car bombs, and suicide bombers that have had serious consequences on military personnel's psychological and physical health (Makin-Byrd et al., 2011). Lastly, the experiences and impacts of war and deployments are continuously changing, depending on the location of war, the enemy, and the developments of new technology and weapons (Allen, Rhoades, Stanley, & Markman, 2010). With the evolution of the all-volunteer force and modern weaponry along with the increase in demands (number and duration of deployments) for military personnel, these differences influence the well-being of military personnel and their spouses. Just as the military continues to navigate the new terrain for every new generation of military personnel, military couples must adapt and navigate the continuously shifting marital landscape.

Military Marriages

Healthy couple functioning is important for the military community because approximately half (56.4%) of military members are married (Cox & Gearhart, 2011; DoD Task Force, 2007). An unhealthy marital relationship has the capability to negatively impact any person's life, military or civilian. The problems that impact military personnel tend to create relational difficulties with their spouse (Makin-Byrd et al., 2011; Sautter et al., 2011). More specifically, 78% of OEF and OIF military personnel reported having at least one family issue, 42% reported difficulties getting along with their spouse, and 35% reported a separation or divorce (Sautter et al., 2011). The civilian partner also experiences challenges in the military marriage, such as taking on the parental role and decision making during separations such as trainings or deployments (Allen et al., 2010). Along with that, Goff, Crow, Reisbig, and Hamilton (2007) assessed male service members who recently deployed to Afghanistan or Iraq

in addition to their female spouses and found that sexual problems and sleep disturbances for the military member predicted lower marital satisfaction for both partners. Also, civilian partners, wives in particular, reported that reintegration, loneliness, staying in touch, fears regarding the physical and psychological health of military husbands, and effects on the children were major sources of relational stress (Allen et al., 2011).

With regard to military marriage as a whole, in a recent study of 300 married couples (Active Duty U.S. Army husband and civilian wife), Allen and colleagues (2011) found that for both partners, combat exposure and the husband's income were significantly related to stress. However, the psychological effects from financial strain were more stressful for husbands and wives than rank or income. Also, couples who reported higher levels of stress also reported more negative spillover from work to home. The same researchers found that although all of the couples included in the study had experienced a recent deployment, infidelity was not reported as a source of stress for husbands or wives. This suggested that military couples' trust in one another may act as a resource within their marriage.

Along with trust being an apparent strength for military marriages, there is research that has suggested that over time, couples gain stress resiliency when the couple endures stressful experiences during the beginning of the marriage (Neff & Broady, 2011). This notion of stress resiliency may also be apparent in military couples who have been in the military for a longer duration, have experienced more deployments, and are of a certain rank. Over time these experiences may allow the couple to be better equipped in coping with stressors. In order to better understanding stress resiliency and ways to maximize the work duties from military personnel, aspects of military life such as length in service, experiences with deployment cycles, and physiological stress should be explored in the context of marital relationships.

Factors Influencing Military Personnel and Their Spouse

There are several factors that have the ability to influence military personnel and his or her spouse. For the purpose of this literature review, the length of time the military personnel has been in the service, the military personnel's rank, and deployments are the factors explored.

Length of time in service. The duration of time personnel are in the military may influence his or her marital relationship because, as mentioned previously, couples have the ability to gain stress resiliency. Over time, as couples experience and practice coping behaviors in regard to military life, the couple could become more equipped to handle future stressors more appropriately. However, Hogan and Seifert (2010) found that active duty military personnel between the ages 23 and 25 are significantly more likely to be married than military personnel who are not active duty or civilians because of the benefits allotted to married active duty personnel. The authors also found that of the active duty personnel that marry within that time frame, they are more likely to divorce than those in the National Guard, Reserve, or civilian population. Since active duty personnel are more likely to divorce, if couples remain married throughout their time in the service, it could suggest an inherent difference between these couples and those that are motivated to get married because of the additional compensation and benefits (Hogan & Seifert, 2010).

Along with that, although information can be found on how military personnel's length of service impacts their benefits (Anderson et al, 2011; DoD, 2010; Karney & Crown, 2007), there is no empirical research examining this factor and relational health. Further, while there is research available on the time spent at home between deployments (General Accounting Office [GAO], 2001), there is no literature that examines the overall duration of military personnel's time in the service and marital health.

However, researchers have found that there is a negative correlation between satisfaction with being in the military (for military personnel) and frequent relocations (GAO, 2001). In addition, the shorter the average time between moves, the more the military member's spouse was in favor of separating from the military altogether (GAO, 2001). This could be because frequent relocation makes it difficult for individuals to keep a healthy social life and support systems or attain educational and career goals (Makin-Byrd et al., 2011). Along with that, military personnel who are newly enlisted, or carry a lower rank are more likely to be re-assigned or move due to training (GAO, 2001). Although it has not been specifically examined, this suggests a relationship between time in the service and the military personnel and their spouse's satisfaction with the military as a career choice.

Rank. Of the military's active duty members, 83.7% are enlisted personnel, whereas 16.3% are officers, and over half (50.3%) of the active duty members are 25 years old and younger (DoD, 2010). Also, more than half (53.7%) of active duty military members are married (DoD, 2010). A significant factor that differentiates enlisted members from officers is their education level (Clemens & Milsom, 2008). Most active duty service members (79.5%) have less than a bachelor's degree (DoD, 2010). More specifically, 93.6% of active duty enlisted personnel have less than a Bachelor's degree (98.5% have at least a high school diploma), whereas, 82.8% of active duty officers have at least a Bachelor's degree (DoD, 2010). Interestingly, when compared to the civilian population, active duty officers have a higher likelihood of having a Bachelor's degree (82.8% of officers compared to 30% of civilians age 25 and older). (DoD, 2010). This statistic is important given that educated personnel often have lower divorce rates. This evidence potentially indicates why there is a lower divorce rate among officers than enlisted personnel (3.8% and 4.5%, respectively) (DoD, 2010).

Further, researchers have found that married enlisted personnel are 62% more likely to get divorced than married civilians, even with basic demographics controlled (Lundquist, 2007). A possible explanation for enlisted personnel to have a higher divorce rate than civilians is because the lowest pay grades (E1-E3) usually correspond with the first years in the military and the first years in the marriage (CBO, 2007). Along with that, in a study done with 300 active duty Army husbands and civilian wives, the husband's rank was significantly and negatively related to his stress level that was assessed through a self-report measure regarding issues, such as, combat, loneliness, and sexual frustration (Cronbach's alpha for husbands was .85 and .84 for wives) (Allen et al, 2011). More specifically, Allen and colleagues (2011) found that husbands with higher rank had less stress because of the power and control within their positions. Therefore, due to the added stressors of military life, along with low pay and less experience in coping with military stressors, it may be more challenging for marriages in the military to be successful, especially when these tend to be younger couples (DoD, 2010).

Another important factor that impacts service members and their families that coincides with rank is housing. The rank of the military member influences the allowance allotted for housing or living expenses. In addition, most bases do not have adequate housing for every resident; therefore, military personnel often live in off-base housing (Ahmed et al., 2005, Buddin et al., 1999) which may be substandard for lower ranked personnel. People often wait as long as two years for military housing, because most military personnel believe that it has better economic benefits than other housing allowances (Buddin et al., 1999). This could be because on-base housing is provided to qualifying families for free, but the value of allowances to rent or purchase off-base housing is determined by rank, duty location, and dependency status. This is an important issue for researchers to consider, since housing has an impact on the quality of life

of military families (Ahmed et al., 2005); quality of life in this instance refers to neighborhoods that are low in crime and offer quality education for children and enriching social activities. Therefore, not only does lower rank of military personnel influence the marital relationship due to the low pay and lower housing allowances, but since lower-ranked personnel and their spouses do not have the practice and experience in dealing with the demands and stressors of military life that higher-ranked personnel do, the rank of the military spouse may influence the marital relationship. This is only further complicated if or when the couple experiences a deployment.

Deployment. As mentioned previously, the armed forces are a volunteer-only operation, therefore, the military is smaller than when the draft was instituted (Makin-Byrd et al., 2011). Further, even during the longest peacetime draft period (1953 to 1964), the military employed about 2.8 million active duty personnel, approximately twice the size of the current military; the current all-volunteer military is smaller because the military must rely on recruiting and retaining its service members (CBO, 2007). Due to the smaller size of the military, military personnel often deploy more than once (Mental Health Advisory Team [MHAT] V, 2008). No time of war has been free of loss or trauma, yet each new war seems to bring with it its own unique challenges.

Although military personnel and their families experience extreme stress during times of deployment, the literature is inconsistent on the impact of multiple deployments (MacGregor, Han, Dougherty, & Galarneau, 2012). For example, the "healthy warrior effect" is a term deemed for military personnel experiencing multiple deployments (MacGregor et al., 2012). The use of this term means that the military personnel who experience more serious illnesses, such as depression, are prohibited from future deployments (MacGregor et al., 2012). Therefore, the

military personnel that do deploy more than once may be a more resilient and healthier population of military members, at least initially.

For the personnel who are deployed, they often report experiences with troubled sleeping, nightmares, fear of loud noises, and depression or feelings of guilt from the loss of fellow service members (Laser & Stephens, 2011). Further, recent deployments to Iraq and Afghanistan have been shown to have a negative effect on military personnel's sleep and sexual behavior (Goff et al., 2007). More specifically, in a study of recently deployed military personnel from OEF and OIF, military personnel's sexual and sleep disturbances had the most influence on the their relationship satisfaction (Goff et al., 2007). These problems also influence the military personnel's spouse and her experiences with the relationship.

Deployments have become a major concern for the well-being of military personnel and their spouses because of the emotional impact it has on each partner and their relationship. In regard to the impact on marriages, deployments seem to have an even greater strain on the spouse of the military member than the military member themselves, due to the maintenance of a household, coping as a single parent, financial difficulties, and marital strain as a result in the lack of communication (Karney & Crown, 2007; Mansfield et al., 2010). Along with that, a study of over 250,000 army wives found that during prolonged periods of deployments, wives experienced an increase in depressive, anxiety, sleep, acute stress reaction and adjustment disorders (Mansfield et al., 2010).

Further, military spouses often experience loneliness, anxiety, and depression (MacGregor et al., 2012; Makin-Byrd et al., 2011; Mansfield et al., 2010). Researchers suggest that spouses experience more emotional stress during deployments if the military personnel is of lower rank, has less military experience and social support, and if the non-deployed spouse is

unemployed (Allen et al., 2010). Military spouses do not only experience hardship during deployment, but also while getting adjusted to the return home (Makin-Byrd et al., 2011). Spouses often experience relief, stress, and mourning while getting acclimated to service members if they return a different person than when they left (e.g., seem irritable, unable to concentrate, are violent) (Makin-Byrd et al., 2011). The strains placed on couples during deployment often lead to increased rates of marital dissatisfaction, unemployment, and decreased emotional health (Karney & Crown, 2007; Mansfield et al., 2010).

An important aspect of deployment that is relevant to military personnel and their spouses is the cycle of deployment. There are five accepted deployment stages according to Pincus and colleagues (2007). The first stage of deployment is pre-deployment. This stage occurs as soon as the military personnel are informed of the deployment and denial and anticipation are often felt by the nonmilitary spouse. Arguments are also common during this stage due to the preparation that the military personnel experience and the physical or emotional distance felt by the spouse. The second stage is called deployment and refers to the first month the military personnel is departed. During this stage, spouses often experience mixed emotions of relief and abandonment. This first month often feels disorganized and phone calls with their spouse can either alleviate or exacerbate stress for both partners. The third stage of deployment is called sustainment and refers to months two through five of deployment. During this stage, nonmilitary spouses gain confidence and independence in their role and begin to establish new routines and sources of support. The fourth stage of deployment is called re-deployment and refers to the month before the military spouse returns home. During this stage nonmilitary spouses often feel anxious and excited about the arrival of their spouse, but also apprehensive about the return of the military personnel and the roles each spouse will play in the marriage.

The last deployment stage is called post-deployment and it refers to three to six months after the military spouse has returned home from deployment. During this stage, a honeymoon period is often experienced followed by tension in redefining the roles of each partner. All of these stages reflect the intense mixture of emotions felt by military members and their spouses during deployments.

Along with the deployment cycle and its influence on the marital relationship, a study found that for members of the Air Force, the longer service members are deployed, the greater their risk of ending their marriage after the return home (Karney & Crown, 2007). However, for other branches of the military, deployments seem to make the marriage more stable; the longer the service member is deployed, the lower the risk of the marriage dissolving (Karney & Crown, 2007). This contradiction shows how complex the impact of deployments are on marital relationships (Karney & Crown, 2007). Along with all of the factors and experiences previously discussed (rank, length of time in the service, deployments), physiological stress also has the ability to influence military personnel and their spouses.

Physiological stress and military couples. Stress is an automatic response from the body after an event or incident (stressor) occurs (Kavanagh, 2005). It is not surprising that the challenges that military personnel experience elicit some level of stress, especially with stress being the second most common health problem, according to the World Health Organization (Varvogli & Darviri, 2011). Even civilian couples face times of stress and problems in their relationship, however, military couples face these issues in addition to the host of additional unique stressors from being in the armed services (Allen et al., 2010; Kotrla & Dyer, 2007). The most common reported stressors for military personnel are being away from family, deployment,

an increase in work load, conflicts between military and family responsibilities, and experiencing a permanent change of station (PCS) (Bray et al., 2010; DoD, 2005).

Along with that, a study of over 12,000 military personnel found that high levels of stress are associated with mental health and interpersonal problems (Hourani, Williams, & Kress, 2006). Furthermore, the same study also found that the young (under 25 years old), lower ranking members experienced higher stress levels and more mental health problems than older, higher ranked members. Results from the study found strong associations between high levels of work and family stress for married members, which is concerning given that 56.4% of all service members are married (Cox & Gearhart, 2011; Karney & Crown, 2007). This association could originate from a spill-over from each domain, such that stress from home impacts the work domain and stress from work impacts the home domain (Bolger, DeLongis, Kessler, & Wethington, 1989). There are not consistent statistics regarding divorce in the military, but there is substantial evidence to suggest the stressors discussed throughout this literature review influence the development of conflictual or unstable marriages (Brown & Hall, 2009).

One way to measure the stress response for military personnel, which is influenced by the factors previously discussed, is through heart rate variability (HRV). HRV measures the body's responses in the sympathetic and parasympathetic (fight vs. flight) systems by measuring the interval times between heart beats (Tan et al., 2009). A person's heart rate is continuously changing and is influenced by several factors, but heart rate ranges can influence how individuals adapt to stress or vice versa. High HRV has been shown to be indicative of better resistance to stress and greater ability to regulate stress (Bornstien & Suess, 2002), whereas low HRV has been related to maladaptive health, such as hypertension and depression (Tan et al., 2009). HRV is used as a marker to understand how individuals are recovering from the stress they are

experiencing, therefore, the lower HRV, the more difficulty individuals have regulating stressors in their everyday life. By measuring the HRV of the military personnel and his or her spouse, it might shed light on how the factors (length of time in service, rank, and deployment) previously explored may influence his or her physiological health. Since stress has been shown to impact interpersonal relationships for military couples (Hourani, Williams, & Kress, 2006), understanding how physiological stress (as measured by HRV) influences the marital relationship may shed more light on the military couples' experience. Along with that, marital satisfaction, adjustment, and quality are three aspects of the marital relationship that may serve as a reflection of the overall health of military couples.

Marital Satisfaction, Adjustment, and Quality in the Context of Military Couples

Although all couples experience feelings of satisfaction differently, generally, marital satisfaction refers to "the extent to which a spouse perceives the marriage to be personally fulfilling and worth maintaining" (Karney & Crown, 2007, p.12). Researchers suggest that the degree of marital satisfaction within a marital relationship is one of the biggest predictors for couples ending or maintaining their marriage (Karney & Bradbury, 1995). Further, marital satisfaction is one of the most commonly assessed indicators of happiness and marital functioning (Zainah, Nasir, Hashim, & Yusof, 2012). More specifically, researchers have found that there are certain variables, such as level of intimacy, amount of disclosure, and division of household chores, that influence marital satisfaction (Laurenceau, Barrett, & Rovine, 2005). Further, researchers have found that the length of time a couple has been married and their income influence marital satisfaction; the longer the marriage and higher the income, the more satisfied the couple (Zainah et al., 2012). Also, in a study of approximately 700 Army couples, Anderson and colleagues (2011) found that when compared to military-civilian marriages, dual-

military couples experienced similar levels of marital satisfaction. Although marital satisfaction is one of the most utilized ways to assess marital health, marital adjustment may also be an influential facet of the marital relationship.

Marital adjustment refers to the couple's ability to adapt to stressors that can influence the marital relationship (Neff & Broady, 2011). Understanding not only how satisfied couples are in their marriages, but also how they are able to adapt to stressful experiences are important features that need to be considered when looking at marital health. Neff and Broady (2011) found that couples who experienced low to moderate stress in the beginning of their marriage had greater marital adjustment than those who did not have experience with early stress. Couples that are maritally adjusted tend to agree on family issues, communicate openly, and use problem solving skills (Erbek, Bestepe, Akar, Eradamlar, & Alpkan, 2005). Although marital satisfaction and adjustment are essential in understanding marital health, assessing marital quality as a third lens on marital health provides a more comprehensive picture of the marital experience.

Marital quality refers to the ways in which couples acknowledge both the positive and negative aspects of their marriage (Holt-Lunstad, Birmingham, & Jones, 2008) while honoring both partner's perspectives (Riggs, Byrne, Weathers, & Litz, 1998). In a study of over 200 married individuals, Holt-Lunstad and colleagues (2008) found that higher marital quality was associated with lower levels of stress and a greater quality of life. In order to gain a complete understanding for military couple's experiences, marital satisfaction, adjustment, and quality will be referred to as marital health.

Systemic Foundation for Understanding Military Marriages

By converging satisfaction, adjustment, and quality, a broader understanding of marital health is revealed. Each of these elements that make up marital health are interwoven and

influenced by the experiences encountered by each partner and through the couple relationship. Due to the interconnectedness of marital satisfaction, adjustment, and quality, systems theory (von Bertalanffy, 1968) becomes relevant through the merging of these concepts. Systems theory is appropriate to guide this thesis because it emphasizes the relationship between different parts and how the parts merge and become a distinct whole, rather than examining each part separately. For example, in order for members of a marital dyad to feel satisfied in their relationship, it seems that each spouse would also report feelings of being able to adjust to stressors that come up in the relationship, as well as being able to identify both positive and negative aspects of the relationship. Further, the relationship between these elements shows that each of these facets are vital in understanding the marital health of military couples and that they each influence one another and the couple's relationship.

Also, just as adjustment, satisfaction, and quality are interconnected, aspects of military life (deployment, rank, and length of time in the service) are also connected with marital health. For example, rank and length of time in the service have the ability to not only influence the military personnel, but also the marital relationship, due to the significant relationship between rank and stress (Allen et al., 2011). Researchers have found that higher levels of stress coincide with a lower rank in the military (Hourani, Williams, & Kress, 2006). Also, the increase in income (Allen et al., 2011) that typically corresponds with a higher rank and length of time in the service may have the ability to influence military personnel's stress and marital health. Further, deployments may be related to the length of time in the service and the marital health of the couple because the longer military personnel are in the service, the more likely they have the opportunity to deploy. Through OIF and OEF this has especially been the case, since the overall population of deployable personnel is smaller (more personnel are being deployed more than

once) than when the draft was instated (MHAT V, 2008). Also, deployments are often stressful on military personnel and their spouse (Allen et al., 2010; Bray et al., 2010; DoD, 2005) which may influence the marital health of the relationship. Researchers have not yet examined how specific elements (deployments, length of time in the service, and rank) that all military personnel experience directly impact marital relationships or how the couple experiences stress. Therefore, the extent to which these common factors influence military couples is unknown and consequently cannot be used to further understand how to meet the needs of military personnel and their spouses.

Summary

Military personnel's length of time in the service, rank, and deployment influence their stress levels as well as that of their spouses. Length of time and rank have the ability to influence stress levels for military personnel because of the added benefits and challenges that coincide with these factors, such as an increase in pay for military personnel that have been in the service longer or changes to a higher rank. Also, deployments have the ability to influence stress levels because of the separation between military personnel and their spouse, however, the number of deployments can also act as buffer for stress because of the gained experience with each separation. These factors not only influence military personnel's stress, but also their performance at their job. Along with that, the stress brought about because of these factors also influences the marital relationship between the military personnel and their spouse. Thus, in order to gain more information about military couples, a systemic lens must be taken through research and ultimately applied to clinical practices and policy agreements for the future of military couples.

References

Ahmed, S., Sukar, A., Burgess, S., Ali, S., Darius, T., & Yeo, L. E. (2005). A study of Fort Sill military housing needs. Retrieved from http://www.lawtonok.org/qualityoflife/fort-sill-housing-needs.pdf

Allen, E. S., Rhoades, G. K., Stanley, S. M., & Markman, H. J. (2010). Hitting home: Relationships between recent deployment, posttraumatic stress symptoms, and marital functioning for Army couples. *Journal of Family Psychology, 24*(3), 280-288. doi:10.1037/a0019405

Allen, E. S., Rhoades, G. K., Stanley, S. M., & Markman, H. J. (2011). On the home front: Stress for recently deployed army couples. *Family Process, 50*(2), 235-247. doi:10.1111/j.1545-5300.2011.01357.x

Anderson, J. R., Johnson, M. D., Goff, B. N., Cline, L. E., Lyon, S. E., Gurss, H. (2011). Factors that differentiated distressed and nondistressed marriages in Army soldiers. *Marriage & Family Review, 47*, 459-473.

Bolger, N., DeLongis, A., Kessler, R. C., & Wethington, E. (1989). The contagion of stress across multiple roles. *Journal of Marriage and the Family, 51*(1), 175-183. doi:10.2307/352378

Bornstein, M.H. & Suess, P.E. (2002). Physiological self-regulation and information processing in infancy: Cardiac vagal tone and habituation. *Child Development, 71*, 273-287. Retrieved from http://ehis.ebscohost.com.jproxy.lib.ecu.edu/ehost/detail?vid=33&hid=4&sid=c09a7f1f71c64ccea8b4a3c6f2bb8627%40sessionmgr12&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#db=a9h&AN=3168440

Bray, R. M., Hourani, L.L., Olmstead, K. L., Witt, M., Brown, J. B., Pemberton, M. R.,… Hayden, H. (2006). *2005 Department of defense survey of health related behaviors among active duty military personnel: A component of the defense lifestyle assessment program.* Research Triangle Park, NC: RTI International.

Bray, R. M., Pemberton, M. R., Lane, M. E., Hourani, L. L., Mattiko, M. J., & Babeu, L. A. (2010). Substance use and mental health trends among U.S. military active duty personnel: Key findings from the 2008 DoD health behavior survey. *Military Medicine, 175*(6), 390-399. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=cmedm&AN=20572470&site=ehost-live

Brown, J. & Hall, B. (2009). Exploring intimate partner communication in military couples: Implications for counselors. In G.R. Walz, J. C. Bleuer, & R. K Yep (Eds.), *Compelling counseling interventions: VISTAS 2009* (pp.55-85). Alexandria, VA: American Counseling Association.

Buddin, R. J., Gresenz, R. C., Hosek, S. D., Elliott, M.N. & Dawson, J.H. (1999). An evaluation of housing options for military families. Retrieved from http://www.cbo.gov/sites/default/files/cbofiles/ftpdocs/83xx/doc8313/07-19-militaryvol.pdf

Clemens, E.V., & Milsom, A. S. (2008). Enlisted service members' transition into the civilian world of work: A cognitive information processing approach. *Career Development Quarterly, 56*(3), 246-256. Retrieved from http://www.freepatentsonline.com/article/Career-Development-Quarterly/177025282.html

Congressional Budget Office (CBO). (2007). The all-volunteer military: Issues and performance. Retrieved from http://www.cbo.gov/sites/default/files/cbofiles/ftpdocs/83xx/doc8313/07-19-militaryvol.pdf

Cox, A. L. & Gearhart, B. (2011). Military marital and family therapy: Policies and practices [PowerPoint Slides]. Retrieved from http://www.ecu.edu/che/alliance/docs/NCFR.pdf

de Burgh, H., White, C. J., Fear, N. T., & Iversen, A. C. (2011). The impact of deployment to Iraq or Afghanistan on partners and wives of military personnel. *International Review of Psychiatry, 23*(2), 192-200. doi:10.3109/09540261.2011.560144

Department of Defense. (2010). *Demographics 2009: Profile of the military community.* Washington, D.C.: Department of Defense.

Department of Defense (DoD) (2011). Strengthening our military families: Meeting America's commitment. Retrieved from http://www.defense.gov/home/features/2011/0111_initiative/Strengthening_our_Military_January_2011.pdf

Department of Defense. (2012). *Demographics 2011: Profile of the military community*. Washington, D. C.: Department of Defense.

DoD Task Force on Mental Health. (2007). *An achievable vision: Report of the DoD Task Force on mental health*. Falls Church, VA: Defense Health Board.

Erbek, E., Beştepe, E., Akar, H., Eradamlar, N., & Alpkan, R. (2005). Marital adjustment. *The Journal of Psychiatry and Neurological Sciences, 18*(1), 39-47.

General Accounting Office (GAO). (2001). Longer time between moves related to higher satisfaction and retention. Retrieved from http://www.gao.gov/new.items/d01841.pdf

Goff, B. S., Crow, J. R., Reisbig, A. M., & Hamilton, S. (2007). The impact of individual trauma symptoms of deployed soldiers on relationship satisfaction. *Journal of Family Psychology, 21*, 344–353. doi: 10.1037/0893-3200.21

Hogan, P. F. & Seifert, R. F. (2010). Marriage and the military: Evidence that those who serve marry earlier and divorce earlier. *Armed Forces and Society, 36*(3), 420-438.

Holt-Lunstad, J., Birmingham, W., & Jones, B. Q. (2008). Is there something unique about marriage? The relative impact of marital status, relationship quality, and network social support on ambulatory blood pressure and mental health. *Annals of Behavioral Medicine, 35*(2), 239-244. doi:10.1007/s12160-008-9018-y

Hourani, L. L., Williams, T. V., & Kress, A. M. (2006). Stress, mental health, and job performance among active duty military personnel: Findings from the 2002 Department of Defense health-related behaviors survey. *Military Medicine, 171*(9), 849-856.

Institute of Medicine (IOM). (2010). *Returning home from Iraq and Afghanistan: Preliminary assessment of readjustment needs of veterans, service members, and their families.* Washington, DC: The National Academies Press. Retrieved from http://www.nap.edu/openbook.php?record_id=12812&page=17

Karney, B. R., & Bradbury, T. N. (1995). The longitudinal course of marital quality and stability: A review of theory, methods, and research. *Psychological Bulletin, 118*, 3–34. doi:10.1037/0033-2909.118.1.3

Karney, B. R., & Crown, J. S. (2007). *Families under stress: An assessment of data, theory, and research on marriage and divorce in the military*. Santa Monica, CA: RAND Corporation.

Kavanagh, J. (2005). *Stress and performance: A review of the literature and its applicability to the military*. Santa Monica, CA: RAND Corporation. Retrieved from http://www.rand.org/pubs/technical_reports/TR192.html

Kotrla, K., & Dyer, P. (2007). Using marriage education to strengthen military families: Evaluation of the active military life skills program. *Social Work & Christianity, 35*(3), 287-311.

Laser, J., & Stephens, P. (2011). Working with military families through deployment and beyond. *Clinical Social Work Journal*, *39*(1), 28-38. doi:10.1007/s10615-010-0310-5

Laurenceau, J. P., Barrett, L. F., & Rovine, M. J. (2005). The interpersonal process model of intimacy in marriage: A daily-diary and multilevel modeling approach. *Journal of Family Psychology, 19*(2), 314-323. http://dx.doi.org/10.1037/0893-3200.19.2.314

Lundquist, J. (2007). A comparison of civilian and enlisted divorce rates during the early all-volunteer force era. *Journal of Political and Military Sociology 35*, 199-217. Retrieved from http://ehis.ebscohost.com/ehost/detail?vid=5&hid=20&sid=4269d20e-2efe4ee687e54bc376a6f98d%40sessionmgr10&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#db=sih&AN=34256125

MacGregor, A. J., Han, P. P., Dougherty, A. L., & Galarneau, M. R. (2012). Effect of dwell time on the mental health of US military personnel with multiple combat tours. *American Journal of Public Health, 102,*A55-A59. Retrieved from http://ehis.ebscohost.com.jproxy.lib.ecu.edu/ehost/detail?vid=20&hid=20&sid=173db67af37c408291abd25a82e75af3%40sessionmgr11&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#db=s3h&AN=71927252

Makin-Byrd, K., Gifford, E., McCutcheon, S., & Glynn, S. (2011). Family and couples treatment for newly returning veterans. *Professional Psychology: Research and Practice*, *42*(1), 47-55. doi:10.1037/a0022292

Mansfield, A. J., Kaufman, J. S., Marshall, S. W., Gaynes, B. N., Morrissey, J. P., & Engel, C. C. (2010). Deployment and the use of mental health services among U.S. army wives. *The New England Journal of Medicine, 362*(2), 101-109. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=cmedm&AN=20071699&site=ehost-live

McCubbin, H. I., Dahl, B. B., Lester, G. R., Benson, D., & Robertson, M. L. (1976). Coping repertoires of families adapting to prolonged war-induced separations. *Journal of Marriage & Family, 38*(3), 461-471. Retrieved from http://ehis.ebscohost.com.jproxy.lib.ecu.edu/ehost/detail?vid=11&hid=20&sid=173db67af37c408291abd25a82e75af3%40sessionmgr11&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#db=sih&AN=5273473

Mental Health Advisory Team (MHAT) V. (2008).*Operation Iraqi Freedom*. Available at: http://www.armymedicine.army.mil/reports/mhat/mhat_v/Redacted1-MHATV-4-FEB-2008-Overview.pdf. Accessed June 15, 2009.

Neff, L. A, & Broady, E. F. (2011). Stress resilience in early marriage: Can practice make perfect? *Journal of Personality and Social Psychology, 101*(5), 1050-67. doi:10.1037/a0023809

Pincus, S. H., House, R., Christenson, J., & Alder, L. E. (2007). The emotional cycle of deployment: A military family perspective. Washington, DC: Army Center of Health Promotion and Preventive Medicine, Office of the Chief, Army Reserve.

Reed, B. J., & Segal, D. R. (2000). The impact of multiple deployments on soldiers' peacekeeping attitudes, morale, and retention. *Armed Forces & Society, 27*(1), 57-78. Retrieved from http://ehis.ebscohost.com.jproxy.lib.ecu.edu/ehost/detail?vid=4&hid=20&sid=173db67af37c408291abd25a82e75af3%40sessionmgr11&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#db=a9h&AN=3814431

Riggs, D. S., Byrne, C. A., Weathers, F. W., & Litz, B. T. (1998). The quality of the intimate relationships of male Vietnam veterans: Problems associated with posttraumatic stress disorder. *Journal of Traumatic Stress, 11*(1), 87-101. doi:10.1023/A:1024409200155

Sautter, F. J., Armelie, A. P., Glynn, S. M., & Wielt, D. B. (2011). The development of a couple-based treatment for PTSD in returning veterans. *Professional Psychology: Research and Practice, 42*(1), 63-69. doi:10.1037/a0022323

Tan, G., Fink, B., Dao, T. K., Hebert, R., Farmer, L. S., Sanders, A., & ... Gevirtz, R. (2009). Associations among pain, PTSD, mTBI, and heart rate variability in veterans of Operation Enduring and Iraqi Freedom: A pilot study. *Pain Medicine, 10*(7), 1237-1245.

Varvogli, L., & Darviri, C. (2011). Stress management techniques: Evidence-based procedures that reduce stress and promote health. *Health Science Journal, 5*(2), 74-89. Retrieved from http://ehis.ebscohost.com.jproxy.lib.ecu.edu/ehost/detail?vid=5&hid=20&sid=cc1f221069854c37bf082581e341e028%40sessionmgr13&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#db=rzh&AN=2011270075

von Bertalanffy, L. (1968). *General systems theory*. New York, NY: George Braziller.

World History Project (2007). Vietnam War statistics. Retrieved from http://history-world.org/vietnam_war_statistics.htm

Zainah, A., Nasir, R., Ruzy, S., & Yusof, N. (2012). Effects of demographic variables on marital satisfaction. Asian Social Science, 8(9), 46-49. Retrieved from http://search.proquest.com/docview/1030094310?accountid=10639

CHAPTER THREE: METHOD

Project Aims and Rationale

This thesis was part of a larger study that focused on physical, psychological, and relational health components of military members and their spouses. The study took place within a family medicine practice on an Air Force base in the southeastern United States. Data were collected from patients and their spouses using self-report measures and biomarkers (e.g., blood pressure and heart rate variability). This information will be used to gain a better understanding of the factors that could affect military couples' health and marital health. For this thesis, baseline data was used for analysis and was gathered from the couples as a part of a visit to the family medicine clinic.

The purpose of this study was to

1. Assess the quality of the relationship between the military personnel and his/her spouse through measurements of marital health (satisfaction, adjustment, and quality).
2. Evaluate how the length of time in service, deployments, and rank influence marital health (satisfaction, adjustment, and quality).

Sample

Participants were married couples recruited from a military family medicine practice. Participants were recruited through IRB approved recruitment measures at the medical center. One of the IRB approved researchers assigned to the medical center asked each visiting patient if he or she was currently married and if so, whether he or she would be interested in participating in the study. Research staff explained the informed consent documents and collected signatures from willing participants. Upon agreement to participate, the participant scheduled the next appointment at the medical center and brought his or her spouse to that visit. If both partners

were present and agreed to the terms of the informed consent, they may have participated at the time of recruitment. The completion of the informed consent and assessment took place in a private room at the family medicine clinic. Eighty-three couples completed the research project. The inclusion criteria for the study were that a) one participant or spouse must be active duty, reserve, or veteran, b) the couple must be currently married, and c) the couple must be seeking medical care at the family medicine clinic. There were no exclusion criteria for this project.

Measures

Data for this study was collected from the military member and his/her spouse. Although the larger study used a variety of measures in order to gain more information, this thesis only used baseline data collected from three measurements. Measurements included questionnaires on marital satisfaction, marital quality, and marital adjustment. In addition to the self-reported questionnaires, participants' heart rate variability (HRV) was used to measure their sympathetic and parasympathetic responses (relaxation and stress responses). Along with these measures, the researcher also analyzed the data collected from a questionnaire given to participants (e.g., personnel rank, number of deployments, and length of time in the military).

To measure marital satisfaction, the Kansas Marital Satisfaction Scale (KMSS) was used because of its brevity, high internal consistency (Cronbach's *alpha* > .95), high test-retest reliability, and due to its high correlation with other marital quality assessments, the KMSS demonstrated concurrent validity (Schumm, Crock, Likcani, Akagi, & Bosch, 2008; Schumm et al., 1986). This measure has three items ("How satisfied are you with your marriage," "How satisfied are you with your relationship with your husband/wife," and "How satisfied are you with your husband/wife as a spouse"). Participants responded to items using a 7-point Likert scale (Extremely dissatisfied, very dissatisfied, somewhat

dissatisfied, mixed, somewhat satisfied, very satisfied, extremely satisfied). This measurement has been used and found reliable in assessing marital instability in military couples (Schumm et al., 2008).

To assess marital quality, the Positive and Negative Quality in Marriage Scale (PANQIMS) was used. This measure was developed by Fincham and Linfield (1997) as a two-dimensional approach to assess positive and negative feelings about spouses. The PANQIMS consists of six items; the three items for positive and negative dimensions are evaluated separately (Mattson, Paldino, & Johnson, 2007). For each of the six items, participants responded by selecting a number on a scale from 0 (Not at all) to 10 (Extremely). The PANQIMS has been shown to have internal consistency and a more detailed account of the behaviors that exist between dyads (Fincham & Linfield, 1997; Mattson, Paldino, & Johnson, 2007). It appears that this assessment has only been used with military couples once previously in the larger study associated with this thesis (Lewis, Lamson, White, Russoniello, Ivanescu, 2012)

To assess marital adjustment, this study used the Marital Adjustment Test (MAT) created by Locke and Wallace in 1959. The MAT was chosen for this project because it has been widely used as an assessment for marital adjustment, is brief, known to have strong internal reliability at .90 and good criterion-related validity (Freeston & Plechaty, 1997), and has been used with military personnel (Sherman, Sautter, Jackson, Lyons, & Han, 2006). This assessment is different from the PANQIMS because it includes partner agreement or disagreement on general issues in the couple's life rather than if the spouses feel positively or negatively about one another. The MAT has fifteen items regarding various aspects of the

dyadic relationship, such as, general marital satisfaction/quality, agreement/disagreement on a variety of issues, and relationship styles (Freeston & Plechaty, 1997).

Lastly, heart rate variability (HRV) was measured for each partner. HRV has been used to assess autonomic nervous system functioning by measuring the time intervals between each heartbeat (HRVLive, 2009). Measuring HRV has allowed researchers to monitor how well participants adapt to unpredictable changes in their lives (Acharya et al., 2006; Tan, Dao, Farmer, Sutherland & Gevirtz, 2011). HRV has been used as an assessment tool with the military population (Jouanin, 2004) and with couples (Smith et al., 2011), but has only been analyzed with couples in the military in the larger study aligned with this thesis (Lewis et al., 2012.).

Research Hypotheses

1.) There will be a positive relationship between the number of deployments the military partner has experienced and the strength of marital health (quality, satisfaction, and adjustment).
2.) There will be a positive relationship between the years the military partner has been in the service and the strength of marital health (quality, satisfaction, and adjustment).
3.) There will be a positive relationship between the rank of the military personnel (E1-E9) and the strength of marital health (quality, satisfaction, and adjustment).
4.) Physiological stress as measured by heart rate variability (HRV) will have a moderating effect on hypotheses 1, 2, 3 and marital health.

Analysis

First, descriptive statistics were analyzed to summarize the sample. Demographic information can be found in Table 1. For hypotheses one, two, and three, correlations were used

to assess the relationship between deployment, length of time in the service, and rank with marital health. Pearson and Spearman's rho correlations were used for analysis. In order to examine hypothesis four, a regression analysis was used to explore if HRV had a moderating effect on the relationship between the military life factors (deployment, rank, and length of time in the service) and marital health (adjustment, quality, and satisfaction) if a correlation between the military factors and marital health was found to be significant. Seven couples were excluded from analysis because their responses violated the normal distribution criteria for the sample; couples' responses were at least three standard deviations from the mean.

References

Acharya, R. U., Joseph, P. K., Kannathal, N., Lim, C. M., & Suri, J. S. (2006). Heart rate variability: A review. *Medical & Biological Engineering & Computing, 44*(12), 1031-1051. doi:10.1007/s11517-006-0119-0

Fincham, F. D., & Linfield, K. J. (1997). A new look at marital quality: Can spouses feel positive and negative about their marriage? *Journal of Family Psychology, 11*(4), 489-502.

Freeston, M. H., & Pléchaty, M. (1997). Reconsiderations of the Locke-Wallace Marital Adjustment Test: Is it still relevant for the 1990s? *Psychological Reports, 81*(2), 419-434. doi:10.2466/PR0.81.6.419-434

HRVLive! (2009). Biocom Technologies. Retrieved January 15, 2012, from http://www.biocomtech.com/products/hrvlive

Jouanin, J., Dussault, C., Pérès, M., Satabin, P., Satabin, P., Pierard, C., & Guezennec, C. (2004). Analysis of heart rate variability after a ranger training course. *Military Medicine, 169*(8), 583-7. Retrieved from http://search.proquest.com/docview/217064439?accountid=10639

Lewis, M.E., Lamson, A. L., White, M. B., Russoniello, C., & Ivanescu, A. (2012). Biopsychosocial health of military members and their spouses. (Unpublished doctoral dissertation). East Carolina University, NC.

Mattson, R. E., Paldino, D., & Johnson, M. D. (2007). The increased construct validity and clinical utility of assessing relationship quality using separate positive and negative dimensions. *Psychological Assessment, 19*(1), 146-151. doi:10.1037/1040-3590.19.1.146

Schumm, W. R., Crock, R. J., Likcani, A., Akagi, C. G., & Bosch, K. R. (2008). Reliability and validity of the Kansas Marital Satisfaction Scale with different response formats in a recent sample of U.S. Army personnel. *Individual Differences Research, 6*(1), 26-37.

Schumm, W. R., Paff-Bergen, L., Hatch, R. C., Obiorah, F. C., Copeland, J. M., Meens, L. D., & Bugaighis, M. A. (1986). Concurrent and discriminant validity of the Kansas Marital Satisfaction Scale. *Journal of Marriage & Family, 48*(2), 381.

Sherman, M. D., Sautter, F., Jackson, M. H., Lyons, J. A., & Han, X. (2006). Domestic violence in veterans with posttraumatic stress disorder who seek couples therapy. *Journal of Marital and Family Therapy, 32*(4), 479-490. doi:10.1111/j.1752-0606.2006.tb01622.x

Smith, T. W., Cribbet, M. R., Nealey-Moore, J., Uchino, B. N., Williams, P. G., MacKenzie, J., & Thayer, J. F. (2011). Matters of the variable heart: Respiratory sinus arrhythmia response to marital interaction and associations with marital quality. *Journal of Personality and Social Psychology, 100*(1), 103-119. doi:10.1037/a0021136

Tan, G., Dao, T. K., Farmer, L., Sutherland, R. J., & Gevirtz, R. (2011). Heart rate variability (HRV) and posttraumatic stress disorder (PTSD): A pilot study. *Applied Psychophysiology and Biofeedback, 36*(1), 27-35. doi:10.1007/s10484-010-9141-y

CHAPTER FOUR: AN EXPLORATION OF MARITAL HEALTH AND STRESS AMONG MILITARY COUPLES

Introduction

Approximately half (48.8%) of Americans over the age of 15 are married (U. S. Census Bureau, 2010) and the benefits of getting married are plentiful. In fact, saying "I do" grants immediate access to approximately 1,100 federal benefits (Freedom to Marry, 2012). The benefits of staying married are also abundant, with a higher quality of life that includes an increase in physical and mental health and emotional and physical satisfaction (Waite & Lehrer, 2003). Further, married couples experience longer lives (Waite & Gallagher, 2000), higher life satisfaction (Waite, 2000), and greater economic security (Schwartz, 2005).

While the benefits of marriage are reflected in several dimensions of life, all couples also experience stressors that impact their daily functioning. Just as marriage has positive benefits on an individual's functioning, marital stress can negatively impact individual functioning (Burman & Margolin, 1992). For example, when compared to nondistressed couples, distressed couples exhibit poorer overall health outcomes (Burman & Margolin, 1992). Along with that, there is research to support the notion that married couples' daily work stress has a detrimental impact on their home life (Schulz, Cowan, Cowan, & Brennan, 2004). While all couples experience turbulent moments in their relationship, military couples encounter unique difficulties and exceptional strengths through military life beyond those often managed in civilian partnerships (Griffin & Morgan, 1988).

Military Marriages

There are approximately 1.5 million active duty service members in today's military (Department of Defense [DoD], 2010a) and approximately 726,000 (56.4%) of these

individuals are married (DoD, 2010a). Further, 58.5% of active duty males and 45.7% of active duty females are married (DoD, 2012). Also, it is important to note that not all military marriages are made up of husbands as the military personnel and wives as civilians; 9.1% of married active duty, Reserve, and Guard are dual-military marriages (DoD, 2012). However, there is not consistent information on the percentage of couples where the husband is the civilian spouse and the wife is the military personnel.

With that being said, healthy couple functioning is important for the military community. An unhealthy marital relationship has the capability to negatively impact any person's life, military or civilian. The problems that impact military personnel also tend to create relational difficulties with their spouse (Makin-Byrd et al., 2011; Sautter et al., 2011). More specifically, 78% of Operation Enduring Freedom and Operation Iraqi Freedom military personnel reported having at least one family issue, 42% reported difficulties getting along with their spouse, and 35% reported a separation or divorce (Sautter et al., 2011). The civilian partner also experiences challenges in the military marriage, such as taking on the parental role and decision making during separations such as trainings or deployments (Allen, Rhoades, Stanley, & Markman, 2010).

Although military culture may challenge marriages, there is research that has suggested that over time, couples gain stress resiliency when the couple endures stressful experiences during the beginning of the marriage (Neff & Broady, 2011). This notion of stress resiliency may also be apparent in military couples who have been in the military for a longer duration, have experienced more deployments, and are of higher rank. Over time, these experiences may allow the couple to be better equipped in coping with stressors. In order to better understand stress resiliency and ways to maximize the work duties for military personnel, aspects of military life

such as length in service, experiences with deployment cycles, and physiological stress should be explored in the context of marital relationships.

Literature Review

The military is a voluntary-only force and it is one of the largest employers in the US that provides specific benefits to personnel for being married (Lemmon, Whyman, & Teachman, 2009) with the intention of ensuring job retention. Although the military offers benefits for married personnel, military couples also experience many hardships due to the demands from being in the armed forces (Laser & Stephens, 2011). Geographic mobility, periodic separations, and long and unpredictable duty hours (Burrell, 2006) are just a few of the elements that influence a military marriage. While these elements may be embraced as strengths in some marriages, others are caught up in the challenges aligned with military life, perhaps more than ever, due to the conflicts in Iraq and Afghanistan (Allen et al., 2010; de Burgh, White, Fear, Iversen, 2011; Karney & Crown, 2007).

As mentioned previously, civilian married couples also experience stressful events and times during their marriage, but the stressors and challenges of military life may leave military members and their spouses more at risk for marital strain. In fact, wives of military members have even reported that military stressors interfere with their ability to effectively maintain their marital relationship and they reported that they did not expect they would have the same relational problems if they were not involved in the military (Karney & Crown, 2007). In addition, researchers have found that the demands of military life often alter the positive bonding, including closeness and intimacy, needed for a healthy marriage due to periodic separations (Markman, Rhoades, Stanley, Ragan, & Whitton, 2010; Rosen & Durand, 2000). Periodic separations can affect the positive connections spouses experience in successful

marriages (Markman et al., 2010). While deployment often gets negative attention for its influence on relationships, researchers have found that spouses who were married to military personnel and had been deployed during Operation Desert Storm reported greater closeness after the deployment (Rosen, Durand, Westhuis, & Teitelbaum, 1995). So little research exists on military marriages, but other factors, in particular, length of time in the service, rank, deployment, and marital and physiological stress are important to explore, especially in relation to positive and disruptive outcomes in relationships. Thus, for the purpose of this article, the length of time the military personnel has been in the service, the military personnel's rank, and frequency of deployments are explored.

Factors Influencing Military Personnel and their Spouse

Length of time in service. The duration of time that personnel are in the military may influence his or her marital relationship due to the increased risk of divorce among those who have been active duty for at least two years (Hogan & Seifert, 2010). On the other hand, couples that have been in the military longer have the ability to gain stress resiliency. Over time, as couples experience and practice coping behaviors in regard to military life, the couple could become more equipped to handle future stressors more appropriately. However, Hogan and Seifert (2010) found that active duty military personnel between the ages 23 and 25 are significantly more likely to be married than military personnel who are not active duty or civilians because of the benefits allotted to married active duty personnel. The authors also found that of the active duty personnel that marry within that time frame, they are more likely to divorce than those in the National Guard, Reserve, or civilian population. Since active duty personnel are more likely to divorce, if couples remain married throughout their time in the service, it could suggest an inherent difference between these couples and those that are

motivated to get married because of the additional compensation and benefits (Hogan & Seifert, 2010). Also, although information can be found on how military personnel's length of service impacts their benefits (Anderson et al, 2011; DoD, 2010a; Karney & Crown, 2007), there is no empirical research examining this factor and relational health.

However, researchers have found that there is a negative correlation between satisfaction with being in the military (for military personnel) and frequent relocations (GAO, 2001). In addition, the shorter the average time between moves, the more the military member's spouse was in favor of separating from the military altogether (GAO, 2001). This could be because frequent relocation makes it difficult for individuals to keep a healthy social life and support systems or attain educational and career goals (Makin-Byrd et al., 2011). Along with that, military personnel who are newly enlisted, or carry a lower rank are more likely to be re-assigned or move due to training (GAO, 2001). Although it has not been specifically examined, this suggests a relationship between time in the service and the military personnel and their spouse's satisfaction with the military as a career choice. Along with the length of time the military personnel has been in the service, rank may also have the ability to influence marital relationships.

Rank. Of the military's active duty members, 83.7% are enlisted personnel, whereas 16.3% are officers, and over half (50.3%) of the active duty members are 25 years old and younger (DoD, 2010a). A significant factor that differentiates enlisted members from officers is their education level (Clemens & Milsom, 2008). Most active duty service members (79.5%) have less than a bachelor's degree (DoD, 2010a). More specifically, 93.6% of active duty enlisted personnel have less than a Bachelor's degree (98.5% have at least a high school diploma), whereas, 82.8% of active duty officers have at least a Bachelor's degree (DoD, 2010a).

Interestingly, when compared to the civilian population, active duty officers have a higher likelihood of having a Bachelor's degree (82.8% of officers compared to 30% of civilians age 25 and older). (DoD, 2010a). This statistic is important given that educated personnel often have lower divorce rates. This evidence potentially indicates why there is a lower divorce rate among officers than enlisted personnel (3.8% and 4.5%, respectively) (DoD, 2010a).

Further, researchers have found that married enlisted personnel are 62% more likely to get divorced than married civilians, even with basic demographics controlled (Lundquist, 2007). A possible explanation for enlisted personnel to have a higher divorce rate than civilians is because the lowest pay grades (E1-E3) usually correspond with the first years in the military and the first years in the marriage (CBO, 2007). Along with that, in a study done with 300 active duty Army husbands and civilian wives, the husband's rank was significantly and negatively related to his stress level that was assessed through a self-report measure regarding issues, such as, combat, loneliness, and sexual frustration (Cronbach's alpha for husbands was .85 and .84 for wives) (Allen et al, 2011). More specifically, Allen and colleagues (2011) found that husbands with higher rank had less stress because of the power and control within their positions. Further, a recent study by Sherman and colleagues (2012) found that leaders (military officers and government officials) had lower levels of stress (as measured by cortisol levels) than non-leaders. The same authors also cited that the sense of power and control that coincides with leadership positions was significant in buffering the effects of stress. Therefore, due to the added stressors of military life, along with low pay and less experience in coping with military stressors, it may be more challenging for marriages in the military to be successful, especially when these tend to be younger, lower ranked couples (DoD, 2010a). This relationship is only further complicated if or when the couple experiences a deployment.

Deployment. Deployment cycles have gotten a lot of attention for better (Rosen et al., 1995) or worse (Duckworth, 2009; Hosek, Kavanagh & Miller, 2006) in the lives of military couples. Deployments tend to have a devastating effect on relationships because of the lack of communication, financial concerns, and the anxiety that accompanies worrying about loved ones who are in combat (Karney & Crown, 2007). Further, the DoD reported that military personnel who have deployed in the last three years showed an increase in work and family stress when compared to non-deployed personnel (Bray et al., 2006). For every branch of the military, family stress is significantly higher for personnel who had deployed than personnel who had not deployed (Bray et al., 2010). However, it is possible that after a certain number of deployments military spouses adapt to the stressors brought on from deploying. For example, Karney and Crown (2007) found that for every branch except the Air Force, the longer the military spouse was deployed, the more stable their relationship.

On the other hand, research suggests that military spouses often experience loneliness, anxiety, and depression (MacGregor, Han, Dougherty, & Galarneau, 2012; Makin-Byrd et al., 2011; Mansfield et al, 2010) throughout the deployment cycle. Researchers suggest that spouses experience more emotional stress during deployments if the military personnel is of lower rank, has less military experience and social support, and if the non-deployed spouse is unemployed (Allen et al., 2010). Military spouses do not only experience hardship during deployment, but also while getting adjusted to the return home (Makin-Byrd et al, 2011). Spouses often experience relief, stress, and mourning while getting acclimated to service members if they return a different person than when they left (e.g., seem irritable, unable to concentrate, are violent) (Makin-Byrd et al., 2011). The strains placed on couples during deployment often lead

to increased rates of marital dissatisfaction, unemployment, and decreased emotional health (Karney & Crown, 2007; Mansfield et al, 2010).

Although military personnel and their families experience extreme stress during times of deployment, the literature is inconsistent on the impact of multiple deployments (MacGregor et al., 2012). For example, the "healthy warrior effect" is a term deemed for military personnel experiencing multiple deployments (MacGregor et al., 2012). The use of this term means that the military personnel who experience more serious illnesses, such as depression, are prohibited from future deployments (MacGregor et al., 2012). Therefore, the military personnel that do deploy more than once may be a more resilient and healthier population of military members, at least initially. This contradiction shows how complex the impacts of deployments are on marital relationships (Karney & Crown, 2007). Along with all of the factors and experiences previously discussed (rank, length of time in the service, deployments), physiological stress also has the ability to influence military personnel and their spouses.

Physiological stress and military couples. Stress is an automatic response from the body after an event or incident (stressor) occurs (Kavanagh, 2005). It is not surprising that the challenges that military personnel experience elicit some level of stress, especially with stress being the second most common health problem, according to the World Health Organization (Varvogli & Darviri, 2011). Even civilian couples face times of stress and problems in their relationship, however, military couples face these issues in addition to the host of additional unique stressors from being in the armed services (Allen et al., 2010; Kotrla & Dyer, 2007). The most common reported stressors for military personnel is being away from family, deployment, an increase in work load, conflicts between military and family responsibilities, and experiencing a permanent change of station (PCS) (Bray et al., 2010).

Marriages are impacted by stressful events and all of the factors mentioned above have the ability to impact the stress levels of the military personnel, spouse, and the marital relationship (Langer, Lawrence & Barry, 2008). Military personnel frequently report sources of stress beyond those aligned with a deployment, including conflicts between military and family responsibilities (Bray et al., 2010). While military events can trigger stress at home, stress in the home can also have a negative effect on military life. Familial stress is a particular concern for the military, because it can interfere with mission readiness and job performance (Bray et al., 2010). The military's concern about reducing stress has become such an important concern that the DoD created family centers for military personnel to aid in balancing the stress from personal relationships and the military lifestyle (Bray et al., 2010). Peripheral stressors, similar to the ones mentioned above, not only impact behavior, but there are also physiological responses that happen within our bodies during times of stress (Segerstrom & Miller, 2004). Though very complex, these responses are often known as a "fight or flight" mechanism and have the ability to make changes to the immune system (Segerstrom & Miller, 2004).

Stress has the ability to influence mental, physical, and relational functioning (Gunlicks-Stoesse & Powers, 2009). Further, relational stress is related to physiological functioning and if physiological stress levels are high, there is a greater risk for poor mental and physical health (Gunlicks-Stoesse & Powers, 2009). Physiological responses also have an influence on how couples regulate the stressors within their relationship (Gunlicks-Stoesse & Powers, 2009). If heightened stress levels within a relationship are not managed, the body's physiological response (such as elevated heart rate) to stress could adapt and make changes in the immune system, thereby making it more difficult for individuals to recover from stressors in the future (Gunlicks-Stoesse & Powers, 2009).

Along with that, a study of over 12,000 military personnel found that high levels of stress are associated with mental health and interpersonal problems (Hourani, Williams, & Kress, 2006). The same study also found that the young (under 25 years old), lower ranking members experienced higher stress levels and more mental health problems than older, higher ranked members. Results from the study found strong associations between high levels of work and family stress for married members, which is concerning given that 56.4% of all service members are married (Cox & Gearhart, 2011; Karney & Crown, 2007). This association could originate from a spill-over from each domain, such that stress from home impacts the work domain and stress from work impacts the home domain (Bolger, DeLongis, Kessler, & Wethington, 1989). There are not consistent statistics regarding divorce in the military, but there is substantial evidence to suggest the stressors discussed throughout this article influence the development of conflictual or unstable marriages (Brown & Hall, 2009).

Lastly, a stress response, (e.g., heart rate variability (HRV)) in particular, may have a moderating effect in the relationship of military life factors and marital health, thus strengthening or weakening the relationship between rank, deployment, time in the service and marital health. HRV is used to measure the autonomic nervous system. More specifically, it measures the relaxation and stress responses from the sympathetic and parasympathetic branches by measuring the interval of times between heart beats (Combatalade, 2010). The heart's beating rate varies moment to moment, and is influenced by many factors, such as physical health (Combatalade, 2010). A person's minimum to maximum heart rate range is indicative of their level of health and can influence their ability to adapt to stressors; the normal range for a healthy individual at rest is between 50-70 beats per minute (HRVLive, 2009). There are three bands that are of importance within the HRV frequency spectrum. These bands are the Very Low

Frequency (VLF), Low Frequency (LF), and High Frequency (HF) (Combatalade, 2010). The variability within one's heart beat is seen as strength in order for individuals to be able to adapt to life changes or stressors.

Further, high HRV has been shown to be indicative of better resistance to stress and greater ability to regulate stress (Bornstien & Suess, 2002), whereas low HRV has been related to maladaptive health, such as hypertension and depression (Tan et al., 2009). HRV is used as a marker to understand how individuals are recovering from the stress he or she is experiencing, therefore, the lower HRV, the more difficulty individuals have regulating stressors in their everyday life. By measuring the HRV of the military personnel and their spouse, it might shed light on how the factors (length of time in service, rank, and deployment) previously explored may influence his or her physiological health. Since stress has been shown to impact interpersonal relationships for military couples (Hourani, Williams, & Kress, 2006), understanding how physiological stress (as measured by HRV) influences the marital relationship may shed more light on the military couples' experience. Along with that, marital satisfaction, adjustment, and quality are three aspects of the marital relationship that may serve as a reflection of the overall health of military couples.

Marital Satisfaction, Adjustment, and Quality in the Context of Military Couples

Although all couples experience feelings of satisfaction differently, generally, marital satisfaction refers to "the extent to which a spouse perceives the marriage to be personally fulfilling and worth maintaining" (Karney & Crown, 2007, p.12). Researchers suggest that the degree of marital satisfaction within a marital relationship is one of the biggest predictors for couples ending or maintaining their marriage (Karney & Bradbury, 1995). Further, marital satisfaction is one of the most common assessments used to reflect happiness and marital

functioning (Zainah, Nasir, Hashim, & Yusof, 2012). More specifically, researchers have found that there are certain variables, such as level of intimacy, amount of disclosure, and division of household chores, that influence marital satisfaction (Laurenceau Barrett, & Rovine, 2005). Further, researchers have found that the length of time a couple has been married and their income influence marital satisfaction; the longer the marriage and higher the income, the more satisfied the couple (Zainah et al., 2012). Also, in a study of approximately 700 Army couples, Anderson and colleagues (2011) found that dual-military couples reported similar levels of marital satisfaction when compared to military-civilian couples. Although marital satisfaction is one of the most utilized assessments used for marital health, marital adjustment may also be an influential facet of the marital relationship.

Marital adjustment refers to the couple's ability to adapt to stressors that can influence the marital relationship (Neff & Broady, 2011). Understanding not only how satisfied couples are in their marriages, but also how they are able to adapt to stressful experiences are important features that need to be considered when looking at marital health. Neff and Broady (2011) found that couples that experienced low to moderate stress in the beginning of their marriage had greater marital adjustment than those who did not have experience with early stress. Couples with better marital adjustment often agree on family issues, communicate openly, and use problem solving skills (Erbek, Bestepe, Akar, Eradamlar, & Alpkan, 2005). Although marital satisfaction and adjustment are essential in understanding marital health, assessing marital quality as a third lens on marital health provides a more comprehensive picture of the marital experience.

Marital quality refers to the ways in which couples acknowledge both the positive and negative aspects of their marriage (Holt-Lunstad, Birmingham, & Jones, 2008) while honoring

both partner's perspectives (Riggs, Byrne, Weathers, & Litz, 1998). In a study of over 200 married individuals, Holt-Lunstad and colleagues (2008) found that higher marital quality was associated with lower levels of stress and a greater quality of life. In order to gain a complete understanding for military couple's experiences, marital satisfaction, adjustment, and quality will be referred to as marital health.

Systemic Foundation for Understanding Military Marriages

By converging satisfaction, adjustment, and quality, a broader understanding of marital health is revealed. Each of these elements that make up marital health are interwoven and influenced by the experiences encountered by each partner and through the couple's relationship. This complex dynamic between marital satisfaction, adjustment, and quality is reflected in general systems theory (von Bertalanffy, 1968) such that a change in one thing, experience, or person influences other things, experiences, and people. Due to the interconnectedness between specific factors in military life, such as, rank, deployment, and the length of time in the service, and marital functioning and stress, the combination of these factors may influence stress and stress reciprocally influences functioning. All of these factors together then can affect partners of a relationship in unique ways, or with even greater complexity can alter the trajectory of a marriage.

The purpose of this article was to examine how characteristics in the lives of military personnel and their spouse influence their marital health (marital satisfaction, adjustment, and quality). More specifically, the factors that pertained to this study were deployment, military personnel's rank, and their length of time in the service. Hypotheses for this study included: a) There will be a positive relationship between the number of deployments the military partner has experienced and the strength of marital health (quality, satisfaction, and adjustment), b) there

will be a positive relationship between the years the military partner has been in the service and the strength of marital health (quality, satisfaction, and adjustment), c) there will be a positive relationship between the higher the rank of the military personnel (E1-E9) and the strength of marital health (quality, satisfaction, and adjustment), d) physiological stress as measured by heart rate variability (HRV) will have a moderating effect on hypotheses a, b, c and marital health .

Method

Participants

Participants were married couples recruited from a military family medicine practice. Participants were recruited through IRB approved recruitment procedures at the medical center. One of the IRB approved researchers assigned to the medical center asked each visiting patient if he or she was currently married and if so, whether they would be interested in participating in the study. Research staff explained the informed consent documents and collected signatures from willing participants. Upon agreement to participate, the participant scheduled the next appointment at the medical center and brought his or her spouse to that visit. If both partners were present and agreed to the terms of the informed consent, they may have participated at the time of recruitment. The completion of the informed consent and assessment took place in a private room at the family medicine clinic. Seven couples were excluded from analysis because their responses violated the normal distribution criteria for the sample; couples' responses were at least three standard deviations from the mean

Measures

Along with these measures discussed below, the researcher also analyzed the data collected from a demographic questionnaire given to participants (e.g., personnel rank, number

of deployments, and length of time in the military). The marital assessments used were the Kansas Marital Satisfaction Scale (KMSS), Positive and Negative Quality in Marriage Scale (PANQIMS), and the Marital Adjustment Test (MAT).

The KMSS was used to measure satisfaction because of its brevity, high internal consistency (Cronbach's alpha > .95), high test-retest reliability, and due to its high correlation with other marital quality assessments, the KMSS demonstrated concurrent validity (Schumm, Crock, Likcani, Akagi, & Bosch, 2008; Schumm et al., 1986). This measure has three items ("How satisfied are you with your marriage," "How satisfied are you with your relationship with your husband/wife," and "How satisfied are you with your husband/wife as a spouse"). This measurement has been used and found reliable in assessing marital instability in military couples (Schumm et al., 2008).

To assess marital quality, PANQIMS was used. This measure was developed by Fincham and Linfield (1997) as a two-dimensional approach to assess positive and negative feelings about spouses. The PANQIMS consists of six items; the three items for positive and negative dimensions are evaluated separately (Mattson, Paldino, & Johnson, 2007). The PANQIMS has been shown to have internal consistency and a more detailed account of the behaviors that exist between dyads (Fincham & Linfield, 1997; Mattson, Paldino, & Johnson, 2007). It appears that this assessment has only been used with military couples once before (Lewis, Lamson, White, Russoniello, Ivanescu, 2010).

The MAT was used to assess marital adjustment. The MAT was used because it has been widely used as an assessment for marital adjustment, is brief, known to have strong internal reliability at .90 and good criterion-related validity (Freeston & Plechaty, 1997), and has been used with military personnel (Sherman, Sautter, Jackson, Lyons, & Han, 2006). This assessment

is different from the PANQIMS because it includes partner agreement or disagreement on general issues in the couple's life rather than if the spouses feel positively or negatively about one another. The MAT has fifteen items regarding various aspects of the dyadic relationship, such as, general marital satisfaction/quality, agreement/disagreement on a variety of issues, and relationship styles (Freeston & Plechaty, 1997).

Lastly, heart rate variability (HRV) was measured for each partner. HRV has been used to assess autonomic nervous system functioning by measuring the time intervals between each heartbeat. Measuring HRV has allowed researchers to monitor how well participants adapt to unpredictable changes in their lives (Acharya et al., 2006; Tan, Dao, Farmer, Sutherland & Gevirtz, 2011). HRV has been used as an assessment tool with the military population (Jouanin, 2004) and with couples (Smith et al., 2011), but as far as we can tell has only been analyzed with couples in the military in one previous study (Lewis et al., 2012.). Again, this publication was based out of the larger study aligned with this thesis.

Context

Only one location was used for the data collection process. The study took place at a military family medicine clinic that mostly serves Air Force members. The clinic is located on an Air Force base in the southeastern part of the United States. This base has about 11,000 total personnel (DoD, 2010). Since this project was only conducted on an Air Force base, it is important to note that the Air Force consistently has the highest percentage of married personnel when compared to the other branches (DoD, 2012).

Procedure

Participants were recruited by researchers while they attended medical appointments. While patients waited for the primary care provider, researchers entered the room, introduced

themselves, explained the procedure and purpose of the study, and obtained contact information from interested patients. Then, the researchers followed up with the patients via phone calls in order to set up an appointment to participate in the project.

Interested participants (couples) met in the clinic waiting room and then were taken to a private room. First, the couple signed informed consent documents. Then, as one spouse filled out the questionnaire in private, his or her spouse would have his or her height, weight, blood pressure, and HRV assessed. To measure HRV, the researcher attached a finger sensor to the non-dominant index finger of the participant. Data from the finger monitor was recorded and collected on a software program (HRVLive, 2009). The HRV Live! (2009) program measures parasympathetic and sympathetic responses, as well as changes in the participants' autonomic balance. This program is unique because of its REAL-TIME feature; this allowed the researcher to see real changes in the participant's HRV when they occurred (HRVLive, 2009). Participants wore the finger monitor for 12 minutes and were asked not to speak or tap the monitor against anything while wearing the device. After the 12 minutes were complete and the spouse finished the paper survey, the partners switched positions. After both partners completed both the paper survey and HRV assessment, the session concluded

Results

Eighty three couples completed the project. However, seven couples were removed from analysis due to outlying responses for rank (n=3), number of deployments (n=1), and HRV (SDNN) scores (n=3). These couples were removed because they had responses that were at least three standard deviations from the mean. Also, two couples where the wife was the only military personnel were not included in analysis due to the low group number. Therefore, seventy-four couples were used for analyses. First, the sample was selected into two groups before any

analyses were run. The groups were divided by dual military couples (both husband and wife were in the military) (n=11) and by couples where only the husband was in the military (n=63). For brevity in this article, these couples will be referred to as HIM (husbands in military). Dual military and HIM couples were separated for analysis in order to examine how deployments, rank, and length of time in the service impact the couple relationship. For dual military couples, 54.5% of husbands and 54.5% of wives were Non-Hispanic Wwhite and 45.5% of husbands and 27.3% of wives were African-American. Also, the mean age for husbands and wives in this group was 35.09 (SD=8.04) and 34.91 (SD=8.99), respectively. The mean length of time in the service (in years) for husbands in this group was 13.20(SD=6.4) and wives were 12.33(SD=6.4).

In addition, for the HIM couple group, most of the husbands (76.2%) and wives (65.5%) were Non-Hispanic White. Also, the mean age for husbands and wives in this group was 36.84 (SD=10.29) and 35.04 (SD=10.35), respectively. The mean length of time in the service (in years) for husbands in this group was 12.37(SD=7.9). See Table 1 for the full sample demographics.

Hypothesis 1

Bivariate correlations were run to examine the relationship between the number of deployments the military personnel had experienced and the three marital measures [Kansas Marital Satisfaction Scale (KMSS), Marital Adjustment Test (MAT), Positive and Negative Quality in Marriage Scale (PANQIMS)]. The first step in this process was to select only the HIM couples (couples where only the husband was in the military). A Pearson correlation coefficient was calculated for the relationship between the husband's number of deployments and the three marital assessments. Although it is not surprising that there were significant correlations found between the marital assessments, new contributions found from this sample

included moderate positive correlations between the number of deployments and the number of years the husband had been in the service, $r(57)=.540$, $p=.000$, and between husbands' number of deployments and husbands' rank, $r(56)=.560$, $p=.000$. No significant correlations were found for the number of deployments and the marital assessment scores.

Next, dual military cases were selected (both the husband and wife were military personnel) and analyzed. However, due to the small sample size in this group, Spearman rho correlations were used for analysis with the dual military group. Spearman is more appropriate for this group because it is a non-parametric test and is best suited for this group's small sample size. Again, it is not surprising that there were significant correlations between the marital assessments, but no correlations were found with the number of deployments husbands and wives experienced with the marital assessments. Not surprising, a moderate positive correlation was found between the number of husbands' deployments and his number of years in the service, $r(10)=.689$, $p=.027$, and a strong positive correlation was found for husbands' number of deployments and wives' years in service, $r(9)=.819$, $p=.007$. For complete correlation results, see Table 2 for HIM couples and see Table 3 for dual military couples.

Hypothesis 2

Pearson correlations were run to examine the relationship between the number of years in the military and the three marital assessments (MAT, KMSS, PANQIMS). For HIM couples, there was a strong positive correlation between the number of years husbands were in the service and his rank, $r(56)=.924$, $p=.000$. However, no significant correlations were found between number of years in the service and the marital assessments. Next, for dual military couples, using Spearman rho correlations, strong positive correlations were found between the years husbands and wives were in the service, $r(9)=.895$, $p=.001$, husbands' years in service and his rank,

r(10)=.905, *p*=.000, and wives' years in service and husbands' rank, *r*(9)=.917, *p*=.001. No significant correlations were found between years in the service and the marital assessments.

Hypothesis 3

Pearson correlations were run to examine the relationship between the rank of military personnel and the three marital assessments (MAT, KMSS, PANQIMS). For HIM couples, no significant correlations were found. However, analysis from this hypothesis included findings for dual military couples that were unexpected. For dual military couples, a strong negative correlation was found between husbands' marital satisfaction and wives' rank, *r*(9)=-.709, *p*=.033. Also, strong negative correlations were found between wives' rank and wives' marital satisfaction, *r*(9)=-.757, *p*=.018, husbands' marital adjustment and wives' rank, *r*(8)=-.730, *p*=.040, and wives' marital adjustment with wives' rank *r*(9)=-.867, *p*=.002. Along with that, a strong positive correlation was found between wives' perception of husband's negative qualities and wives' rank, *r*(9)=.855, *p*=.003. Lastly, husbands' perception of wives' negative qualities was strongly and positively correlated with wives' rank, *r*(9)=.704, *p*=.034.

Hypothesis 4

Before examining if any of the significant correlations previously discussed were moderated by stress response (HRV), bivariate correlations were run to explore if any of the factors examined (deployment, length of time in the service and rank) were significantly related to HRV (SDNN). For HIM couples, a weak positive relationship was found for husbands' and wives' SDNN levels, *r*(61)=.320, *p*=.012.

For dual military couples, results showed a strong positive relationship between wives' SDNN and wives' rank, *r*(9)=.794, *p*=.011and a strong negative correlation between wives' SDNN and wives' marital adjustment score *r*(11)=-.700, *p*=.016. Also, husbands' SDNN was

moderately and negatively correlated with husbands' marital satisfaction, $r(11)=-.653$, $p=.029$, and wives' positive quality score, $r(11)=-.639$, $p=.034$. Lastly, husbands' SDNN was strongly and positively correlated with husbands' perceptions of wives' negative qualities, $r(11)=.849$, $p=.001$.

Lastly, since the only significant findings from this study that would be relevant to perform a linear regression model for were the significant correlations from the dual military couple group, a linear regression was not able to be performed. The small sample size of this group did not allow this test to be used without violating linear regression assumptions.

Discussion

The purpose of this article was to examine how characteristics of military personnel and their spouse influence marital health (marital satisfaction, adjustment, and quality). More specifically, the factors that pertained to this study were deployment, military personnel's rank, and length of time in the service.

There are several important findings from this study that offer a unique contribution when compared to past literature and other results that coincide with previous research. First, this study adds to current literature regarding the connectedness between military factors. For example, for both HIM and dual military couples, husbands' number of deployments and his years in service were related. This finding makes sense since the longer someone is in the military, the greater likelihood that they may experience multiple deployments (DoD, 2010b). Further, this study also found that husbands' rank from the HIM group was positively related to his number of deployments; since length of time in the service and rank have been found to be related in the current and study and from previous researchers (DoD, 2010a), it makes sense that deployments and rank are also linked.

Next, in regard to the relevant findings using the marital assessments, the results of this study further support previous literature that suggests the number of deployments is not directly related to marital health; Anderson and colleagues (2011) found no significant relationship between deployments and relationship distress with Army couples. When examined as a whole, 35 years was the average age for this sample with almost thirteen years in the service, thus, the current results support existing literature on how couples who are newer to the military and are lower ranked experience more stress and adjustments from deployments (Allen et al., 2010) since deployments with marital health or stress were not significant factors in this study. Further, since previous literature has examined the negative effects of deployments on military personnel and the marital relationship (Karney & Crown, 2007; Mansfield et al., 2010), yet the current study, along with Allen and colleagues (2010) found that deployment did not influence marital health, further research is needed to explore how deployments can strengthen or strain the marital relationship.

This study adds to previous literature regarding reports of husbands and wives from both HIM (husband is military personnel) and dual military couples being satisfied (Anderson et al., 2011) and well-adjusted (Rosen et al, 1995) in their marriages. These findings are interesting for dual military couples, because one could speculate that the military stressors that personnel experience would be exacerbated when both spouses are in the military. However, since both partners are in the military, they may be able to show greater empathy and understanding towards their partner. Also, since this study found that both groups of couples reported similar outcomes in marital satisfaction and adjustment, this result could be reflective of policies and organizations that the Air Force has implemented in order to support couples and families (Department of the Air Force, n.d.). Support services or policies may act as a buffer for military

personnel and marriages. This suggestion is especially relevant, given that this sample is Air Force and the Air Force has the highest percentage of married personnel (DoD, 2010a) and the lowest divorce rate (DoD, 2010a) when compared to other branches.

Even though couples reported to be satisfied and adjusted, the current study offered interesting findings regarding wives' rank and marital health for dual military couples. For example, this study found that wives' rank was negatively related to her reports of marital satisfaction and adjustment. This means that as wives' rank increased, the less satisfied and adjusted she felt in her marriage. Also, this finding is interesting since husbands' marital satisfaction and adjustment also decreased as wives' rank increased. Further, as wives' rank increased so did husbands' and wives' reports of negative marital quality. Since these findings were not consistent in the HIM group, a possible explanation for these findings is that husbands' negative attitudes about his wives' rank impact both spouses' views on their marital health. Also, another explanation for this finding that is more consistent with previous literature (Lewis et al., 2012), this finding could suggest that husband's marital health does not tend to be influenced by his own psychosocial factors, but it is influenced by the psychosocial factors of his wife. Thus, these appear to be unique findings that should be explored further in future research.

Finally, this study found that husbands' and wives' SDNN levels were significantly related for the HIM group. This is congruent with current researchers who found that physiological stress between couples is reciprocal (Kenny, Kashy, & Cook, 2006). This suggests that each partner's health has the ability to positively or negatively impact his or her partner's physiological stress levels. Also, the current study found that for dual military couples, husbands' SDNN was negatively related to his marital satisfaction and his positive marital quality. This finding could mean that husbands who were unsatisfied in their marriages or

reported more negative qualities about their spouse had healthier stress responses. Along with that, for the dual military group, a negative association was found between wives' stress response and her marital adjustment. This finding suggests that as wives' marital adjustment increases, her ability to respond to stressors decreases. These findings are unique and difficult to explain based on the variables explored in this study. However, it may be valuable to look at the larger data set that these variables were drawn from to see if other variables and further analyses could better explain these relationships, with a particular interest in mediating variables. Further, most of the current literature on dual military marriages was done with Army couples (Anderson et al., 2011; Lakhani & Gade; 1992; Schumm, Bell, Rice, & Sanders, 1996), thus, there may be an organizational difference between the service branches that helps account for these unique results. Along with that, for future research, it would be valuable for researchers to examine the assessments that are being given to military couples since the adjustment assessment used in this study (MAT) was not designed for military couples, there may be a unique difference within this population that is impacting the results from this measure.

In addition to the previous findings, this study also found that husbands' SDNN was negatively related to wives' reports of the positive qualities in her spouse. This could mean that when husbands are unable to manage their stress, wives' find it more difficult to see husband's positive traits. Lastly, since the current study found that dual military wives' SDNN was positively related to her rank, this finding is congruent with the results from other studies regarding higher rank being associated with less stress (Allen at al., 2011) and the stress resiliency model; in that couples may become better equipped to deal with stressors as they gain more experience in the military (Neff & Broady, 2011).

Limitations

Although there were significant findings from this article, several limitations should be taken into consideration. For example, for this sample, the number of deployments did not have a significant relationship to marital satisfaction, quality, and adjustment. However, the locations and lengths of deployments were not assessed in this study. Without knowledge of deployment locations or lengths, further information about the difficulties of deployment or risk to combat exposure is unknown. Further, the majority of this sample had either never experienced a deployment (n=18) or had only experienced one to five deployments (n=44); the limited experience in deployments may explain why there were no significant results regarding the number of deployments. Also, the rank distribution in this sample is incongruent with the larger Air Force population; there was only one officer included in this study, whereas, there is a 1:4 ratio of officers to enlisted personnel in the Air Force (DoD, 2010a). This could account for the lack of significant evidence regarding rank and marital health (restricted range dampens correlations).

In addition, this study was only conducted at one Air Force base, thus the results are not generalizable to the entire Air Force or other branches of the military. Further, due to the time commitment (the study took approximately 45 minutes to complete); the couples that committed to participate in this study may be inherently different from other couples that experience greater marital strain. Finally, no information about the military personnel's jobs was obtained for this study; knowledge about this sample's job type may have shed more light on their physiological stress and marital relationship. Despite these limitations, there were several strengths related to this study, such as, being able to compare HIM and dual military couples, discovering that husbands and wives responded similarly to marital adjustment and satisfaction, that their

physiological stress response was congruent, and that wives' rank was negatively related to marital health.

Implications

The impact of military life on personnel should be a major concern to marriage and family therapists since there are approximately 1.5 million active duty service members (DoD, 2010), one million in the National Guard and Reserve forces (Cox & Gearhart, 2011), 21.8 million veterans (U.S. Department of Veterans Affairs, 2010) , and approximately 9.6 billion beneficiaries (Cox & Gearhart, 2011). Therefore, the likelihood that family therapists will encounter clients with present or past military experience or that have personal relationships with military personnel is great. This is especially vital since more military couples are seen in private practices with LMFTs (American Association of Marriage and Family Therapy, 2012) than in other contexts. Therefore, being able to recognize some aspects of military culture and basic factor that set military couples and families apart from civilians (deployments, rank structure, frequent relocations, etc) will be essential in providing services and support to this population. This is especially true now that the wars in Iraq and Afghanistan are coming to an end and the military personnel and families that have been involved in these conflicts over the last decade may start to identify detrimental effects to their physical, psychological, or relational well-being. Clinicians should be accepting, respectful, and willing to learn about the experiences of military personnel, partners, and families because each client's understanding may be different based on their personal experience with the military. Also, the foundational theory for marriage and family therapy is general systems theory and the results from this study brought systems theory to life by showing that husbands' and wives' marital health and physiological stress

interconnected with one another. Therefore, clinicians should continue to use a systemic lens in order to meet the unique, but interrelated, needs of military couples.

Future research in this area should include a more thorough understanding of the couple's experience while trying to assess for marital or physiological distress, such as, job type, how long a couple has been stationed at a particular base, if the civilian partner is employed, information about experiences within the deployment locations, and current organizational support given to couples to encourage healthy marriages and families. For example, protective resources and organizational policies in the Air Force may be reflected in these findings (e.g. similar marital health scores in husbands and wives). Therefore, researchers need to evaluate the effectiveness of the programs the military is promoting to support couples and families. In order to ensure that military personnel have appropriate resources available to them, the effectiveness and success of these programs is crucial.

Lastly, additional research examining dual military relationships is an important next step in exploring military couples. This is especially true since this study found unique results regarding the relationship between wives' rank and marital health, along with marital health and physiological stress for dual military couples. Lastly, differences between the military branches may be useful in order to guide policy making, especially since higher divorce rates exist in the other branches.

References

Acharya, R. U., Joseph, P. K., Kannathal, N., Lim, C. M., & Suri, J. S. (2006). Heart rate variability: A review. *Medical & Biological Engineering & Computing, 44*(12), 1031-1051. doi:10.1007/s11517-006-0119-0

Allen, E. S., Rhoades, G. K., Stanley, S. M., & Markman, H. J.(2010). Hitting home: Relationships between recent deployment, posttraumatic stress symptoms, and marital functioning for Army couples. *Journal of Family Psychology, 24*(3), 280-288. doi:10.1037/a0019405

Allen, E. S., Rhoades, G. K., Stanley, S. M., & Markman, H. J. (2011). On the home front: Stress for recently deployed army couples. *Family Process, 50*(2), 235-247. doi:10.1111/j.1545-5300.2011.01357.x

American Association of Marriage and Family Therapy. (2012). DoD fact sheet. Retrieved from http://www.aamft.org/imis15/Content/Advocacy/DOD_Factsheet.aspx

Anderson, J. R., Johnson, M. D., Goff, B. N., Cline, L. E., Lyon, S. E., Gurss, H. (2011). Factors that differentiated distressed and nondistressed marriages in Army soldiers. *Marriage & Family Review, 47*, 459-473.

Bolger, N., DeLongis, A., Kessler, R. C., & Wethington, E. (1989). The contagion of stress across multiple roles. *Journal of Marriage and the Family*, *51*(1), 175-183. doi:10.2307/352378

Bornstein, M.H. & Suess, P.E. (2002). Physiological self-regulation and information processing in infancy: Cardiac vagal tone and habituation. *Child Development, 71,* 273-287. Retrieved from http://ehis.ebscohost.com.jproxy.lib.ecu.edu/ehost/detail?vid=33&hid=4&sid=c09a7f1f71c64ccea8b4a3c6f2bb8627%40sessionmgr12&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#db=a9h&AN=3168440

Bray, R. M., Pemberton, M. R., Lane, M. E., Hourani, L. L., Mattiko, M. J., & Babeu, L. A. (2010). Substance use and mental health trends among U.S. military active duty personnel: Key findings from the 2008 DoD health behavior survey. *Military Medicine, 175*(6), 390-399. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=cmedm&AN=20572470&site=ehost-live

Brown, J. & Hall, B. (2009). Exploring intimate partner communication in military couples: Implications for counselors. In G.R. Walz, J. C. Bleuer, & R. K Yep (Eds.), *Compelling counseling interventions: VISTAS 2009* (pp. 55-85). Alexandria, VA: American Counseling Association.

Burman, B. & Margolin, G.(1992). An analysis of the association between marital relationships and health problems: An interactional perspective. *Psychological Bulletin, 112*, 39-63. doi: 10.1037/0033-2909.112.1.39

Burrell, L. M., Adams, G. A., Durand, D. B., & Castro, C. (2006). The impact of military lifestyle demands on well-being, army, and family outcomes. *Armed Forces & Society, 33*(1), 43-58. doi:10.1177/0002764206288804

Clemens, E. V., & Milsom, A. S. (2008). Enlisted service members' transition into the civilian world of work: A cognitive information processing approach. *Career Development Quarterly, 56*(3), 246-256. Retrieved from http://www.freepatentsonline.com/article/Career-Development-Quarterly/177025282.html

Combatalade, D.C. (2010). Basics of heart rate variability applied to psychophysiology. Retrieved from http://www.emfandhealth.com/HRVThoughtTechnology.pdf

Congressional Budget Office (CBO). (2007). The all-volunteer military: Issues and performance. Retrieved from http://www.cbo.gov/sites/default/files/cbofiles/ftpdocs/83xx/doc8313/07-19-militaryvol.pdf

Cox, A. L. & Gearhart, B. (2011). Military marital and family therapy: Policies and practices [PowerPoint Slides]. Retrieved from http://www.ecu.edu/che/alliance/docs/NCFR.pdf

de Burgh, H., White, C. J., Fear, N. T., & Iversen, A. C. (2011). The impact of deployment to Iraq or Afghanistan on partners and wives of military personnel. *International Review of Psychiatry, 23*(2), 192-200. doi:10.3109/09540261.2011.560144

Department of Air Force. (n.d.) Air Force readiness edge family. Retrieved from http://www.afcrossroads.com/famseparation/pdf/ReadinessFAmily.pdf

Department of Defense (DoD) (2010a). Demographics report. Retrieved from http://www.militaryhomefront.dod.mil//12038/Project%20Documents/MilitaryHOMEFRONT/Reports/2010_Demographics_Report.pdf

Department of Defense (DoD) (2010b). Report on the impact of deployment of members of the Armed Forces on their dependent children. Retrieved from http://www.militaryonesource.mil/12038/MOS/Reports/Report_to_Congress_on_Impact_of_Deployment_on_Military_Children.pdf

Department of Defense. (2012). *Demographics 2011: Profile of the military community*. Washington, D. C.: Department of Defense.

Duckworth, D. (2009). Affects of multiple deployments on families. United Sates of America War College (USAWC) Strategy Research Project. Carlisle Barracks: PA. Retrieved from http://www.dtic.mil/cgibin/GetTRDoc?Location=U2&doc=GetTRDoc.pdf&AD=ADA498029

Erbek, E., Beştepe, E., Akar, H., Eradamlar, N., & Alpkan, R. (2005). Marital adjustment. *The Journal of Psychiatry and Neurological Sciences, 18*(1), 39-47.

Fincham, F. D., & Linfield, K. J. (1997). A new look at marital quality: Can spouses feel positive and negative about their marriage? *Journal of Family Psychology, 11*(4), 489-502.

Freedom to Marry (2012). Protections and responsibilities of marriage. Retrieved from http://www.freedomtomarry.org/pages/protections-and-responsibilities-of-marriage

Freeston, M. H., & Pléchaty, M. (1997). Reconsiderations of the Locke-Wallace Marital Adjustment Test: Is it still relevant for the 1990s? *Psychological Reports, 81*(2), 419-434. doi:10.2466/PR0.81.6.419-434

General Accounting Office (GAO) (2001). Longer time between moves related to higher satisfaction and retention. Retrieved from http://www.gao.gov/new.items/d01841.pdf

Griffin, W. A., & Morgan, A. R. (1988). Conflict in maritally distressed military couples. *American Journal of Family Therapy, 16*(1), 14–22. doi: 10.1080/01926188808250703

Gunlicks-Stoessel, M. L., & Powers, S. I. (2009). Romantic partners' coping strategies and patterns of cortisol reactivity and recovery in response to relationship conflict. *Journal of Social & Clinical Psychology, 28*(5), 630-649.

Hogan, P. F. & Seifert, R. F. (2010). Marriage and the military: Evidence that those who serve marry earlier and divorce earlier. *Armed Forces and Society, 36*(3), 420-438.

Holt-Lunstad, J., Birmingham, W., & Jones, B. Q. (2008). Is there something unique about marriage? The relative impact of marital status, relationship quality, and network social support on ambulatory blood pressure and mental health. *Annals of Behavioral Medicine, 35*(2), 239-244. doi:10.1007/s12160-008-9018-y

Hosek, J., Kavanagh, J., & Miller, L. (2006). *How deployments affect service members*. Santa Monica, CA: RAND Corporation and research on marriage and divorce in the military. Santa Monica, CA: RAND Corporation.

Hourani, L. L., Williams, T. V., & Kress, A. M. (2006). Stress, mental health, and job performance among active duty military personnel: Findings from the 2002 Department of Defense health-related behaviors survey. *Military Medicine, 171*(9), 849-856.

HRVLive! (2009). Biocom Technologies. Retrieved January 15, 2012, from http://www.biocomtech.com/products/hrvlive

Jouanin, J., Dussault, C., Pérès, M., Satabin, P., Satabin, P., Pierard, C., & Guezennec, C. (2004). Analysis of heart rate variability after a ranger training course. *Military Medicine, 169*(8), 583-7. Retrieved from http://search.proquest.com/docview/217064439?accountid=10639

Karney, B. R., and Bradbury, T. N. (1995). The longitudinal course of marital quality and stability: A review of theory, methods, and research. *Psychological Bulletin, 118*, 3–34. doi:10.1037/0033-2909.118.1.3

Karney, B. R., & Crown, J. S. (2007). *Families under stress: An assessment of data, theory, and research on marriage and divorce in the military*. Santa Monica, CA: RAND Corporation.

Kavanagh, J. (2005). *Stress and performance: A review of the literature and its applicability to the military*. Santa Monica, CA: RAND Corporation. Retrieved from http://www.rand.org/pubs/technical_reports/TR192.html

Kenny, D. A., Kashy, D. A., & Cook, W. L. (2006). *Dyadic data analysis*. New York, NY: Guilford Press.

Kotrla, K., & Dyer, P. (2007). Using marriage education to strengthen military families: Evaluation of the active military life skills program. *Social Work & Christianity, 35*(3), 287-311.

Lakhani, H. & Gade, P. A. (1992). Career decisions of dual military career couples: A multidisciplinary analysis of the U.S. Army. *Journal of Economic Psychology, 13*(1), 153-166. Retrieved from http://www.sciencedirect.com/science/article/pii/016748709290057E)

Langer, A., Lawrence, E., & Barry, R. A. (2008). Using a vulnerability-stress-adaptation framework to predict physical aggression trajectories in newlywed marriage. *Journal of Consulting and Clinical Psychology, 76*(5), 756-768. doi:10.1037/a0013254

Laser, J., & Stephens, P. (2011). Working with military families through deployment and beyond. *Clinical Social Work Journal*, *39*(1), 28-38. doi:10.1007/s10615-010-03105

Laurenceau, J. P., Barrett, L. F., & Rovine, M. J. (2005). The interpersonal process model of intimacy in marriage: A daily-diary and multilevel modeling approach. *Journal of Family Psychology, 19*(2), 314-323. http://dx.doi.org/10.1037/0893-3200.19.2.314

Lemmon, M., Whyman, M., & Teachman, J. (2009). Active-duty military service in the United States: Cohabiting unions and the transition to marriage. *Demographic Research, 20* (10), 195-208. Retrieved from http://ehis.ebscohost.com.jproxy.lib.ecu.edu/ehost/detail?vid=27&hid=4&sid=c09a7f1f71c64ccea8b4a3c6f2bb8627%40sessionmgr12&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#db=sih&AN=41021475

Lewis, M.E., Lamson, A. L., White, M. B., Russoniello, C., & Ivanescu, A. (2012). Biopsychosocial health of military members and their spouses. (Unpublished doctoral dissertation). East Carolina University, NC.

Lundquist, J. (2007). A comparison of civilian and enlisted divorce rates during the early all-volunteer force era. *Journal of Political and Military Sociology 35,* 199-217. Retrieved from http://ehis.ebscohost.com/ehost/detail?vid=5&hid=20&sid=4269d20e-2efe-4ee6-87e54bc376a6f98d%40sessionmgr10&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#db=sih&AN=34256125

MacGregor, A. J., Han, P. P., Dougherty, A. L., & Galarneau, M. R. (2012). Effect of dwell time on the mental health of US military personnel with multiple combat tours. *American Journal of Public Health, 102,*A55-A59. Retrieved from http://ehis.ebscohost.com.jproxy.lib.ecu.edu/ehost/detail?vid=20&hid=20&sid=173db67af37c408291abd25a82e75af3%40sessionmgr11&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#db=s3h&AN=71927252

Makin-Byrd, K., Gifford, E., McCutcheon, S., & Glynn, S. (2011). Family and couples treatment for newly returning veterans. *Professional Psychology: Research and Practice, 42*(1), 47-55. doi:10.1037/a0022292

Mansfield, A. J., Kaufman, J. S., Marshall, S. W., Gaynes, B. N., Morrissey, J. P., & Engel, C. C. (2010). Deployment and the use of mental health services among U.S. Army wives. *The New England Journal of Medicine, 362*(2), 101-109. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=cmedm&AN=20071699&site=ehost-live

Markman, H. J., Rhoades, G. K., Stanley, S. M., Ragan, E. P., & Whitton, S. W. (2010). The premarital communication roots of marital distress and divorce: The first five years of marriage. *Journal of Family Psychology, 24*(3), 289-298. doi:10.1037/a0019481

Mattson, R. E., Paldino, D., & Johnson, M. D. (2007). The increased construct validity and clinical utility of assessing relationship quality using separate positive and negative dimensions. *Psychological Assessment, 19*(1), 146-151. doi:10.1037/1040-3590.19.1.146

Neff, L. A, & Broady, E. F. (2011). Stress resilience in early marriage: Can practice make perfect? *Journal of Personality and Social Psychology, 101*(5), 1050-67. doi:10.1037/a0023809

Riggs, D. S., Byrne, C. A., Weathers, F. W., & Litz, B. T. (1998). The quality of the intimate relationships of male Vietnam veterans: Problems associated with posttraumatic stress disorder. *Journal of Traumatic Stress, 11*(1), 87-101. doi:10.1023/A:1024409200155

Rosen, L. N., & Durand, D. B. (2000). Coping with the unique demands of military family life. In J. Martin, L. Rosen, & L. Sparacino (Eds.). *The military family: A practice guide for human service providers* (pp. 55–72). Westport, CT: Praeger.

Rosen, L. N., Durand, D., Westhuis, D. J. & Teitelbaum, J. M. (1995). Marital adjustment of army spouses one year after Operation Desert Storm. *Journal of Applied Social Psychology, 25,* 677–692. doi: 10.1111/j.1559-1816.1995.tb01768.x

Sautter, F. J., Armelie, A. P., Glynn, S. M., & Wielt, D. B. (2011). The development of a couple-based treatment for PTSD in returning veterans. *Professional Psychology: Research and Practice, 42*(1), 63-69. doi:10.1037/a0022323

Schulz, M. S., Cowan, P. A., Cowan, C. P., & Brennan, R. T. (2004). Coming home upset: Gender, marital satisfaction, and the daily spillover of workday experience into couple interactions. *Journal of Family Psychology, 18,* 250–263. doi:10.1037/0893-3200.18.1.250

Schumm, W. R., Crock, R. J., Likcani, A., Akagi, C. G., & Bosch, K. R. (2008). Reliability and validity of the Kansas Marital Satisfaction Scale with different response formats in a recent sample of U.S. Army personnel. *Individual Differences Research, 6*(1), 26-37.

Schumm, W. R., Paff-Bergen, L., Hatch, R. C., Obiorah, F. C., Copeland, J. M., Meens, L. D., & Bugaighis, M. A. (1986). Concurrent and discriminant validity of the Kansas Marital Satisfaction Scale. *Journal of Marriage & Family, 48*(2), 381.

Schwartz, J. (2005). The socio-economic benefits of marriage: A review of recent evidence from the United States. *Economic Affairs, 25*(3), 45-51. doi: 10.1111/j.1468-0270.2005.00571.x

Segerstrom S. C., & Miller, G. E. (2004) Psychological stress and the human immune system: A meta-analytic study of 30 years of inquiry. *Psychological Bulletin,130*(4), 601–630. Retrieved from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC1361287/?tool=pubmed

Tan, G., Fink, B., Dao, T. K., Hebert, R., Farmer, L. S., Sanders, A., & ... Gevirtz, R. (2009). Associations among pain, PTSD, mTBI, and heart rate variability in veterans of Operation Enduring and Iraqi Freedom: A pilot study. *Pain Medicine, 10*(7), 1237-1245.

U. S. Census Bureau. (2010). American community survey. Retrieved from http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_10_1YR_S1201&prodType=table

U.S. Department of Veteran Affairs (2010). National center for veterans analysis and statistics: Selected research highlights. Retrieved from http://www.va.gov/vetdata/docs/QuickFacts/Reports-slideshow.pdf

Varvogli, L., & Darviri, C. (2011). Stress management techniques: Evidence-based procedures that reduce stress and promote health. *Health Science Journal, 5*(2), 74-89. Retrieved from http://ehis.ebscohost.com.jproxy.lib.ecu.edu/ehost/detail?vid=5&hid=20&sid=cc1f221069854c37bf082581e341e028%40sessionmgr13&bdata=JnNpdGU9ZWhvc3QtbGl2ZQ%3d%3d#db=rzh&AN=2011270075

von Bertalanffy, L. (1968). *General systems theory*. New York, NY: George Braziller.

Waite, L. J. (2000). Trends in men's and women's well-being in marriage. In: Waite, L., Bachrach, C., Hindin, M., Thomson, E., & Thornton, A. (Eds.), *The ties that bind: Perspectives on marriage and cohabitation (368-392).* New York, NY: Aldine de Gruyter.

Waite, L.J. & Gallagher, M. (2000). *The case for marriage: Why married people are happier, healthier, and better off financially*. New York, NY: Doubleday.

Waite, L. J., & Lehrer, E. L. (2003). The benefits from marriage and religion in the United States: A comparative analysis. *Population and Development Review, 29*(2), 255-276. Retrieved from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2614329/

Zainah, A., Nasir, R., Ruzy, S., & Yusof, N. (2012). Effects of demographic variables on marital satisfaction. Asian Social Science, 8(9), 46-49. Retrieved from http://search.proquest.com/docview/1030094310?accountid=10639

Table 1. *Demographic Information for Dual Military and HIM couples*

Variable	Dual military		HIM	
	Husband(n=11)	Wife(n=11)	Husband(n=63)	Wife(n=63)
Age (Mean/SD)	35.09(8.04)	34.91(8.99)	36.84(10.29)	35.04(10.35)
Race				
Non-Hispanic White	6(54.5%)	6(54.5%)	48(76.2%)	41(65.5%)
African-American	5(45.5%)	3(27.3%)	7(11.1%)	7(11.1%)
Hispanic	---	---	4(6.3%)	6(9.5%)
Asian	---	---	---	5(7.9%)
Biracial	---	---	1(1.6%)	---
Other	---	2(18.2%)	3(4.8%)	4(6.3%)
Education				
Grade 9-11	---	---	----	4(6.3%)
GED/HS Diploma	1(9.1%)	2(18.2%)	10(15.9%)	17(27%)
Some College	7(63.6%)	7(63.6%)	43(68.3%)	26(41.3%)
College Graduate	3(27.3%)	2(18.2%)	8(12.7%)	13(20.6%)
Graduate School	---	---	2(3.2%)	2(3.2%)
Time in Service in Years (Mean/SD)	13.20(6.4)	12.33(6.4)	12.37(7.9)	---
Rank				
E-3	---	---	8(12.7%)	---
E-4	1(9.1%)	---	7(11.1%)	---
E-5	4(36.4%)	4(36.4%)	12(19%)	---
E-6	1(9.1%)	---	12(19%)	---
E-7	4(36.4%)	4(36.4%)	11(17.5%)	---
E-8	---	---	5(7.9%)	---
E-9	---	---	1(1.6%)	---
Lt. General	---	1(9.1%)	---	---
Number of Deployments				
None	1(9.1%)	1(9.1%)	16(25.4%)	---
1-5	4(36.4%)	6(54.6%)	34(54%)	---
6-10	5(45.5%)	1(9.1%)	7(11.2%)	---

Couple Types	
Dual military (both military)	11(14.5%)
HIM (husband military only)	63(82.9%)
Wife military only	2(2.6%)

Table 2. *Bivariate Correlations for HIM (husbands in military) Couples*

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Years in Service	–												
2. Rank	.924**	–											
3. Deployment	.540**	.560**	–										
4. SDNN (H)	-.153	-.124	.140	–									
5. SDNN (W)	-.007	-.109	-.010	.320*	–								
6. KMSS (H)	-.060	-.035	.239	-.078	-.010	–							
7. KMSS (W)	-.029	-.016	.161	.038	.042	.373**	–						
8. MAT (H)	-.040	.075	.183	-.074	.026	.774**	.371*	–					
9. MAT (W)	.088	.145	.199	.047	-.054	.507**	.748**	.549**	–				
10. PMQ (H)	.042	.190	.202	-.124	-.081	.683**	.278*	.51**	.463**	–			
11. NMQ (H)	.220	.176	-.155	-.013	.121	-.69**	-.35**	-.52**	-.198	-.35**	–		
12. PMQ (W)	-.151	-.138	.037	-.160	.106	.179	.531**	.195	.366	.132	.014	–	
13. NMQ (W)	-.140	-.261	-.195.	-.096	-.026	-.48**	-.56**	-.48**	-.66**	-.36**	.32**	-.110	–

H=Husbands. W=Wives
*p < .05. **p < .01.

Table 3. *Bivariate Correlations for Dual Military Couples*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1.Years in Service (H)	-															
2.Years in Service (W)	.89**	-														
3.Rank (H)	.91**	.91**	-													
4.Rank (W)	-.256	.257	.280	-												
5.Deployment (H)	689*	.82**	.624	.000	-											
6.Deployment (W)	.102	.218	.266	.042	.103	-										
7.SDNN (H)	.030	.209	-.032	.621	.258	-.29	-									
8.SDNN (W)	.115	.067	.259	.794*	-.36	.217	-.082	-								
9.KMSS (H)	-.044	-.282	-.050	-.71*	-.23	.184	-.65*	-.301	-							
10.KMSS (W)	-.247	-.299	-.237	-.76*	-.12	.486	-.477	-.563	.680*	-						
11.MAT (H)	-.150	-.228	-.053	-.73*	-.21	.140	-.624	-.333	.957**	.614	-					
12.MAT (W)	-.309	-.299	-.323	-.87**	-.12	.051	-.400	-.70*	.775**	.88**	.77**	-				
13.PMQ (H)	-.006	-.494	.050	-.597	-.18	.283	-.597	-.256	.916**	.685*	.95**	.718*	-			
14.NMQ (H)	.409	-.494	.309	.704*	.390	-.13	.85**	.183	-.755**	-.63*	-.78**	-.685*	-.70*	-		
15.PMQ (W)	-.113	-.111	-.083	-.585	-.24	.563	-.64*	-.315	.793**	.92**	.718*	.79**	.83**	-.68*	-	
16.NMQ (W)	.343	.515	.375	.86**	.177	-.25	.142	.467	-.705*	-.590	-.652*	-.609*	-.68*	.418	-.562	-

H=Husbands. W=Wives.
*$p<.05$. **$p<.01$.

CHAPTER FIVE: DISCUSSION

Researchers should be concerned about the well-being of military couples and families due to the increase in the amount of military personnel that have experienced geographic movement, periodic separations, and long and unpredictable duty hours because of the conflicts with Iraq and Afghanistan (Burrell, 2006). This is especially true since of the 1.5 million active duty members, 726,000 (56.4%) are married and have experienced a recent increase in work and family life stress for the military personnel (Bray et al., 2006) and for his or her spouse (Karney & Crown, 2007) because of the conflicts in Iraq and Afghanistan. With that being said, the purpose of this research project was to examine how characteristics of military personnel and his or her spouse influence their physiological stress and marital health (marital satisfaction, adjustment, and quality).

More specifically, the factors that pertained to this study were deployment, military personnel's rank, and their length of time in the service. Ultimately, this project aimed to add to the current literature regarding the challenges of military life that not only impact the military personnel, but also his or her spouse and the marital relationship. The deterioration of marital relationships has the ability to impact the performance of military personnel, which could ultimately have an impact on national security. Therefore, this project examined how typical factors in military culture may influence physiological stress and the marital relationship in order to aid clinicians in gaining a deeper understanding of military couples' experiences and to guide future programs created to support military couples.

The previous four chapters each explored distinct areas of military life and factors that impact military couples. Chapter one discussed demographics regarding military life and included a discussion about factors that influence military marriages. Also, the theory (general

systems theory) that grounded this thesis was explored via a conceptual model showing the relationship between the factors (number of deployments, length of time in the service, rank, marital adjustment, satisfaction, and quality, and physiological stress) that were discussed and analyzed in this project.

Chapter two integrated current literature that was relevant for exploring the current need of research on military couples. The themes discussed in the literature review were the differences between past and recent wars, the experiences of each spouse in a military marriage, factors that influence service members and their spouses (e.g., deployments, rank, and length of time in service) and how the stress from military life shapes the experiences of military personnel and their spouse. Chapter three discussed the purpose and rationale for this thesis. Also, chapter three included a detailed description of the study's methodology, including the sample, the measures assessed, the research hypotheses and a brief description of the analyses used to answer the hypotheses.

Chapter four, a publishable manuscript, discussed the complex dynamics of military marriages and common stressors that impact military couples. Also, an examination of the current literature regarding military couple's stress was presented. The results of this study support other findings (Zainah, Nasir, Hashim, & Yusof, 2012) that suggest the longer couples have been married, the greater their level of marital satisfaction. This study found that husbands' and wives' physiological stress responses were related. This adds to current literature (Gunlicks-Stoesse & Powers, 2009; Hourani, Williams, & Kress, 2006) by recognizing that stress influences the marital relationship even though husbands and wives were well-adjusted, satisfied, and had related physiological stress. In addition, a unique finding from this study was related to

wives' rank and the couples' marital health. The present chapter will include recommendations for clinicians and researchers.

Clinical Recommendations

Since husbands' and wives' physiological stress responses were related, clinicians should be aware of the implications that physiological stress can have on relationships (Gunlicks-Stoesse & Powers, 2009). In order to bridge the gap between biological and relational health, Medical Family Therapists (MedFTs) are appropriate to consider as part of treatment teams due to their orientation with the biopsychosocial (BPS) (Engel, 1977) model and with systems theory (von Bertalanffy, 1968). Using a systemic lens is critical in order for clinicians to meet the comprehensive needs of military couples due to the biological, psychological, and social effects that being in the military can have on well-being. Further, as military factors (e.g., deployments) influence biological health, MedFTs' training in collaborative care will be beneficial in treating or supporting military couples since every dimension of his or her life should be accounted for and addressed through a systemic lens. Further, these findings should suggest that clinicians' assessments should address biological and social health, as well as assessing for the unique experiences of each military personnel (e.g., rank).

Clinicians should be accepting, respectful, and willing to learn about the experiences of military personnel, partners, and families because each client's understanding may be different based on his or her personal experience with the military. This instruction is relevant since results from previous literature show that deployments can strengthen (Rosen, Durand, Westhuis, & Teitelbaum, 1995) or weaken (Duckworth, 2009; Hosek, Kavanagh & Miller, 2006) the marital relationship. Along with that, it is important to keep in mind that while exploring the health and relationships of military couples, strengths (Rosen et al.,1995) and positive

interactions (Markman, Rhoades, Stanley, Ragan, & Whitton, 2010; Rosen et al., 2000) have been found for couples and should continue to be taken into consideration. A strength based approach may help military couples feel more comfortable seeking help, when needed. Also, since relational health is often disregarded (Cardona & Ritchie, 2007; Hoge et al., 2008) in the military, military personnel and couples may seek help from civilians in private practice rather than other contexts (American Association of Marriage and Family Therapy, 2012). Thus, family therapists in community contexts (outside of military bases and Veteran Affairs' Clinic) should familiarize themselves with the experiences of military personnel and be trained in the relational aspects of treatment that are unique to this culture.

Recommendations for Further Research

The results from this study revealed that further longitudinal research needs to be done to evaluate the impact that deployments have on marital relationships, since there is inconsistent reports of the impact of deployments on marital functioning. Along with that, research on deployments should differentiate between combat and non-combat related deployments. This distinction appears to be important because the current study did not assess for deployment location and deployments did not appear to have a significant relationship on marital health, but locations have been shown to have an impact on military personnel's well-being (Hoge et al., 2008). Further, some researchers suggest that deployments have a negative impact on couples (DoD, 2012; Karney & Crown, 2007; Mansfield et al., 2010), whereas, other researchers found that deployments have the ability to strengthen relationships (Markman et al., 2010; Rosen & Durand, 2000). Due to this discrepancy, further research is needed to examine the effects of deployments via relational research and throughout the deployment cycle in order to provide continued support for military couples coming back from the wars in Iraq and Afghanistan.

Further research implications from this study include the need to learn more about what has contributed to healthier and or sustaining marriages. There are programs that exist to support military couples (Stanley et al, 2005), but an evaluation of the effectiveness of these programs is essential in ensuring that the couples in greatest need of support are receiving it. This is essential in order to ensure that the programs are not only effective in recruiting and helping couples, but that they have the ability to continuously meet the ever changing needs of military personnel and their families (DoD, 2010)

Finally, the results of this study suggest that more research is needed to explore dual military relationships because this study found that stress and marital health were related to wives' rank. On the other hand, a greater sense of compassion and understanding of each other's work environment and more context for understanding the influence of rank and frequency or location of deployments may decrease marital stress. Further empirical research is needed to evaluate these relationships. In addition, by including qualitative measures, researchers may gain a deeper understanding and richness for dual military couples' experiences and what they desire for support toward successful marital health.

Along with that, longitudinal data is also essential in gauging couples' experiences while in the military and beyond, especially with regard to ways in which the couple interfaced with the last decade of war (Operations Enduring and Iraqi Freedom). Examining if there are unique differences (such as, types of deployments, marital and familial support, work or home life stress, etc.) for each branch of the military may be useful in gaining further information about the distinct needs of the population within each branch.

Conclusion

Since military couples experience a variety of unique stressors that have the ability to influence their physiological health and their marital relationship, using a systemic lens to treat and support these couples is essential. This study brought out an awareness regarding women's rank as it relates to marital health. These outcomes deserve attention to better understand whether the outcome is related to challenges for women in the military or if it just the combined exponential challenges that come when both partners are active duty. It is hoped that the results from this study will aid in further developing effective support organizations and treatment modalities (through a collaborative lens) for military couples.

References

American Association of Marriage and Family Therapy. (2012). DoD fact sheet. Retrieved from http://www.aamft.org/imis15/Content/Advocacy/DOD_Factsheet.aspx

Burrell, L. M., Adams, G. A., Durand, D. B., & Castro, C. (2006). The impact of military lifestyle demands on well-being, Army, and family outcomes. *Armed Forces & Society*, *33*(1), 43-58. doi:10.1177/0002764206288804

Bray, R. M., Hourani, L. L., Olmstead, K. L., Witt, M., Brown, J. B., Pemberton, M. R., …Hayden, H. (2006). *2005 department of defense survey of health related behaviors among active duty military personnel: A component of the defense lifestyle assessment program. Research Triangle Park, NC*: RTI International.

Cardona, R. A., & Ritchie, E. C. (2007). U.S. military enlisted accession mental health screening: History and current practice. *Military Medicine*, *172*(1), 31-35

Department of Defense. (2010). Demographics report. Retrieved from http://www.militaryhomefront.dod.mil//12038/Project%20Documents/MilitaryHOMEFRONT/Reports/2010_Demographics_Report.pdf

Department of Defense. (2012).Defense budget priorities and choices. Retrieved from http://www.defense.gov/news/Defense_Budget_Priorities.pdf

Duckworth, D. (2009). Effects of multiple deployments on families. United Sates of America War College (USAWC) Strategy Research Project. Carlisle Barracks: PA. Retrieved from http://www.dtic.mil/cgibin/GetTRDoc?Location=U2&doc=GetTRDoc.pdf&AD=ADA498029

Engel, G. L. (1977). The need for a new medical model: A challenge for biomedicine. *Science, 196*(4286), 129-136.

Gunlicks-Stoessel, M. L., & Powers, S. I. (2009). Romantic partners' coping strategies and patterns of cortisol reactivity and recovery in response to relationship conflict. *Journal of Social & Clinical Psychology*, *28*(5), 630-649.

Hogan, P. F. & Seifert, R. F. (2010). Marriage and the military: Evidence that those who serve marry earlier and divorce earlier. *Armed Forces and Society, 36*(3), 420-438.

Hoge, C. W., Castro, C. A., Messer, S. C., McGurk, D., Cotting, D. I., & Koffman, R. L. (2008). Combat duty in Iraq and Afghanistan, mental health problems and barriers to care. *U.S. Army Medical Department Journal*, 7-17.

Hosek, J., Kavanagh, J., & Miller, L. (2006). *How deployments affect service members*. Santa Monica, CA: RAND Corporation.

Hourani, L. L., Williams, T. V., & Kress, A. M. (2006). Stress, mental health, and job performance among active duty military personnel: Findings from the 2002 Department of Defense health-related behaviors survey. *Military Medicine, 171*(9), 849-856.

Karney, B. R., & Crown, J. S. (2007). *Families under stress: An assessment of data, theory, and research on marriage and divorce in the military*. Santa Monica, CA: RAND Corporation.

Mansfield, A. J., Kaufman, J. S., Marshall, S. W., Gaynes, B. N., Morrissey, J. P., & Engel, C. C. (2010). Deployment and the use of mental health services among U.S. Army wives. *The New England Journal of Medicine, 362*(2), 101-109. Retrieved from http://search.ebscohost.com/login.aspx?direct=true&db=cmedm&AN=20071699&site=ehost-live

Markman, H. J., Rhoades, G. K., Stanley, S. M., Ragan, E. P., & Whitton, S. W. (2010). The premarital communication roots of marital distress and divorce: The first five years of marriage. *Journal of Family Psychology, 24*(3), 289-298. doi:10.1037/a0019481

Rosen, L. N., & Durand, D. B. (2000). Coping with the unique demands of military family life. In J. Martin, L. Rosen, & L. Sparacino (Eds.). *The military family: A practice guide for human service providers* (pp. 55–72). Westport, CT: Praeger.

Rosen, L. N., Durand, D., Westhuis, D. J. & Teitelbaum, J. M. (1995). Marital adjustment of army spouses one year after Operation Desert Storm. *Journal of Applied Social Psychology, 25,* 677–692. doi: 10.1111/j.1559-1816.1995.tb01768.x

Stanley, S. M., Allen, E. S., Markman, H. J., Saiz, C. C., Bloomstrom, G., Thomas, R., . . . Bailey, A. E. (2005). Dissemination and evaluation of marriage education in the Army. *Family Process, 44,* 187–201.

von Bertalanffy, L. (1968). *General systems theory*. New York, NY: George Braziller.

Zainah, A., Nasir, R., Ruzy, S., & Yusof, N. (2012). Effects of demographic variables on marital satisfaction. *Asian Social Science, 8*(9), 46-49. Retrieved from http://search.proquest.com/docview/1030094310?accountid=10639

APPENDIX A: IRB APPROVALS

From: Odam, Kimberly L Ms CIV USA MEDCOM USAMRMC [mailto:Kimberly.Odam@us.army.mil]
Sent: Wednesday, May 23, 2012 12:52 PM **To:** Lamson, Angela **Cc:** Duchesneau, Caryn L Ms CIV USA MEDCOM USAMRMC; 'Ashley.Fisher@tatrc.org'; Jennings, Dawn V CIV USA MEDCOM USAMRAA; Brosch, Laura R Dr CIV USA MEDCOM USAMRMC; Bennett, Jodi H Ms CIV USA MEDCOM USAMRMC; Odam, Kimberly L Ms CIV USA MEDCOM USAMRMC; Katopol, Kristen R Ms CTR US USA MEDCOM USAMRMC; 'jeffrey.stephenson@tatrc.org'; Kitchen, Susan E Ms CTR US USA MEDCOM USAMRMC; Cistola, David **Subject:** A-17093.1 HRPO Approval for the Protocol (Proposal Log Number 10251005, Award Number W81XWH-11-2-0221) (UNCLASSIFIED)

Classification: **UNCLASSIFIED**
Caveats: NONE

SUBJECT: Initial Approval for the Protocol, "Integrated Care With Military Couples," Submitted by Angela L. Lamson, PhD, East Carolina University, Greenville, North Carolina, in Support of the Proposal, "Operation Re-entry NC," Submitted by David P. Cistola, MD, East Carolina University, Greenville, North Carolina, Proposal Log Number 10251005, Award Number W81XWH-11-2-0221, HRPO Log Number A-17093.1

1. The subject protocol version 2 was approved by the East Carolina University (ECU) Institutional Review Board (IRB) on 15 May 2012. This protocol was reviewed by the U.S. Army Medical Research and Materiel Command (USAMRMC), Office of Research Protections (ORP), Human Research Protection Office (HRPO) and found to comply with applicable Department of Defense (DOD), U.S. Army, and USAMRMC human subjects protection requirements.

2. This greater than minimal risk study is approved for the accrual of 200 subjects.

3. The Principal Investigator has a duty and responsibility to foster open and honest communication with research subjects. The USAMRMC strongly encourages the Principal Investigator to provide subjects with a copy of the research protocol, if requested, with proprietary and personal information redacted as needed.

4. Please note that a Research Monitor (RM) is required to be involved in DOD-supported research studies that are determined to pose more than minimal risk to subjects (DOD Instruction 3216.02, Nov 2011). If the duties of the RM could require disclosure of subjects' Protected Health Information outside a covered entity (i.e., the RM is not an agent of the covered entity), your institution may require the identity and location of the RM to be described in the study Health Information Portability and Accountability Act authorization.

5. Please note the following reporting obligations. **Failure to comply could result in suspension of funding.**

a. Substantive modifications to the research protocol and any modifications that could potentially increase risk to subjects must be submitted to the HRPO for approval prior to implementation. The USAMRMC ORP HRPO defines a substantive modification as a change in Principal Investigator, change or addition of an institution, elimination or alteration of the consent process, change to the study population that has regulatory implications (e.g. adding children, adding active duty population, etc.), significant change in study design (i.e. would prompt additional scientific review), or a change that could potentially increase risks to subjects. All other amendments must be submitted with the continuing review report.

b. All unanticipated problems involving risk to subjects or others must be promptly reported by phone (301-619-2165), by email (HRPO@amedd.army.mil), or by facsimile (301-619-7803) to the HRPO. A complete written report will follow the initial notification. In addition to the methods above, the complete report can be sent to the U.S. Army Medical Research and Materiel Command, ATTN: MCMR-RP, 504 Scott Street, Fort Detrick, Maryland 21702-5012.

c. Suspensions, clinical holds (voluntary or involuntary), or terminations of this research by the IRB, the institution, the sponsor, or regulatory agencies will be promptly reported to the USAMRMC ORP HRPO.

d. A copy of the continuing review report and the re-approval notification by the ECU IRB must be submitted to the HRPO as soon as possible after receipt of approval. According to our records, it appears the current approval by the ECU IRB expires on 3 April 2013. Please note that the HRPO also conducts random audits at the time of continuing review and additional information and documentation may be requested at that time.

e. The final study report submitted to the ECU IRB, including a copy of any acknowledgement documentation and any supporting documents, must be submitted to the HRPO as soon as all documents become available.

f. The knowledge of any pending compliance inspection/visit by the Food and Drug Administration (FDA), Office for Human Research Protections, or other government agency concerning this research; the issuance of inspection reports, FDA Form 483, warning letters, or actions taken by any regulatory agencies including legal or medical actions; and any instances of serious or continuing noncompliance with the regulations or requirements must be reported immediately to the HRPO.

6. **Please note**: The USAMRMC ORP HRPO conducts random site visits as part of its responsibility for compliance oversight. Accurate and complete study records must be maintained and made available to representatives of the USAMRMC as a part of their responsibility to protect human subjects in research. Research records must be stored in a confidential manner so as to protect the confidentiality of subject information.

7. Do not construe this correspondence as approval for any contract funding. Only the Contracting Officer/Grants Officer can authorize expenditure of funds. It is recommended that you contact the appropriate contract specialist or contracting officer regarding the expenditure of funds for your project.

8. The HRPO point of contact for this study is Susan Kitchen, BS, Human Subjects Protection Scientist, at 301-619-1126 Susan.Kitchen@us.army.mil.

KIMBERLY L. ODAM, MS, CIP
Human Subjects Protection Scientist
Human Research Protection Office
Office of Research Protections
U.S. Army Medical Research and Materiel Command

Note: The official copy of this approval memo is housed with the protocol file at the Office of Research Protections, Human Research Protections Office, 504 Scott Street, Fort Detrick, MD 21702. Signed copies will be provided upon request.

Classification: **UNCLASSIFIED**
Caveats: NONE

From: Candia, Jessica CIV USAF AFMSA/SGE-C [mailto:Jessica.Candia@pentagon.af.mil] **Sent:** Friday, August 19, 2011 12:33 PM **To:** Lamson, Angela **Cc:** Bartoe, Chelsea L Maj USAF ACC 4 FW/JA; James, Amy D Capt USAF ACC 4 MDOS/SGOW **Subject:** Protocol FSG200110025H

Hello Ma'am,

My office has completed our review of the protocol FSG200110025H, "Integrated Care with Military Couples". Our human research protection compliance concerns have been resolved. Thus, we now concur with IRB approval of this activity. The activity can now begin, to the extent permitted by other applicable requirements.

Thank you for your assistance with this matter, and good luck with your research.

Sincerely,
Jessica

Jessica Candia, CIV, DAF
Program Manager
Research Oversight and Compliance Office
5201 Leesburg Pike, Suite 1501B
Falls Church, VA 22041
703-681-6311
jessica.candia@pentagon.af.mil

EAST CAROLINA UNIVERSITY
University & Medical Center Institutional Review Board Office
1L-09 Brody Medical Sciences Building· Mail Stop 682
600 Moye Boulevard · Greenville, NC 27834
Office **252-744-2914** **252-744-2914** · Fax **252-744-2284** ·
www.ecu.edu/irb

Notification of Continuing Review Approval

From:	Social/Behavioral IRB
To:	Angela Lamson
CC:	
Date:	4/5/2012
Re:	CR00000276 UMCIRB 11-0207 Integrated Care with Military Couples

I am pleased to inform you that at the convened meeting on 4/4/2012 of the Social/Behavioral IRB , this research study underwent a continuing review and the committee voted to approve the study. Approval of the study and the consent form(s) is for the period of 4/4/2012 to 4/3/2013.

The Social/Behavioral IRB deemed this study Greater than Minimal Risk.

Changes to this approved research may not be initiated without UMCIRB review except when necessary to eliminate an apparent immediate hazard to the participant. All unanticipated problems involving risks to participants and others must be promptly reported to the UMCIRB. The investigator must submit a continuing review/closure application to the UMCIRB prior to the date of study expiration. The investigator must adhere to all reporting requirements for this study.

The approval includes the following items:

Name	Description	Modified	Version
Informed Consent Form-Control Group	Consent Forms	11/4/2011 3:06 PM	0.01

Informed Consent Form-Experimental Group	Consent Forms	11/4/2011 3:06 PM	0.01
Informed Consent: Provider	Consent Forms	3/27/2012 1:34 PM	0.01
Military Questionnaire Packet	Surveys and Questionnaires	11/4/2011 2:15 PM	0.01
Military Questionnaire Packet	Interview/Focus Group Scripts/Questions	11/4/2011 2:15 PM	0.01
Military Questionnaire Packet	Other Medical Procedures/Considerations	11/4/2011 2:33 PM	0.01
Military Questionnaire Packet	Standardized/Non-Standardized Instruments/Measures	11/4/2011 2:11 PM	0.01
Recruitment Script	Recruitment Documents/Scripts	10/26/2011 11:16 AM	0.01
Timeline and Intervention Guide	Study Protocol or Grant Application	10/21/2011 3:14 PM	0.01
Updated processing form and other approved materials	Additional Items	3/27/2012 1:36 PM	0.01
Updated Recruitment Script	Recruitment Documents/Scripts	3/27/2012 1:32 PM	0.01

The following UMCIRB members were recused for reasons of potential for Conflict of Interest on this research study: None

The following UMCIRB members with a potential Conflict of Interest did not attend this IRB meeting: None

Note:

1. The Social/Behavioral IRB committee rated this study as greater than minimal risk because the interventions include motivational interviewing and solution focused questions (which exceed what would be part of a standard physical or psychological examination).

2. The Heart Rate Variability (HRV) is a sensor that poses no potential for physical harm.

IRB00000705 East Carolina U IRB #1 (Biomedical) IORG0000418
IRB00003781 East Carolina U IRB #2 (Behavioral/SS) IORG0000418 IRB00004973
East Carolina U IRB #4 (Behavioral/SS Summer) IORG0000418

APPENDIX B: PERMISSION TO USE MEASURES

Name	**Date of permission given (via email) for publication of use for this thesis**	**Approved by**	**Original approval for use of measure**
Kansas Marital Satisfaction Scale	March 18, 2013	Emma Willcox, Wiley	March 10, 2011
Marital Adjustment Test	March 18, 2013	Emma Willcox, Wiley	March 10, 2011
Positive and Negative Quality in Marriage Scale	March 16, 2013	Frank Fincham	March 5, 2011

APPENDIX C: MEASURES

Demographics Section

Please complete the following questionnaire.

1. In what year were you born? _____
2. What is your gender?
    a. Male
    b. Female

Relational Information

3. Are you currently in a romantic relationship?
    a. Yes
        i. If yes, how long have you been together (include time dating and/or marriage) _____
    b. No
4. Are you currently…
    a. Married
        i. If so how many times? _____
    b. Divorced
    c. Widowed
    d. Separated
    e. Never been married
    f. A member of an unmarried couple

Education/Vocational Information

5. What is the highest grade or year of school you completed?
    a. Never attended school or only attended kindergarten
    b. Grades 1 through 8(Elementary)
    c. Grades 9 through 11 (Some high school)
    d. Grade 12 or GED (High school graduate)
    e. College 1 year to 3 years (Some college of technical school
    f. College 4 years (College graduate)
    g. Graduate School(Advance Degree)

6. Are you currently: (Please choose one)
    a. Employed for wages
    b. State government employee
    c. Federal government employee
    d. Self-employed
    e. Out of work for more than 1 year
    f. Out of work for less than 1 year
    g. A homemaker
    h. A student
    i. Retired
    j. Unable to work
7. If you are employed by the military… (if not, skip to #16)
    a. How many years have you been employed? _____
    b. What is your rank? _____
    c. How many deployments have you had?_____
    d. When was the return date of your last deployment?_____

Health Factors

1. What is your Height?_____
2. What is your Weight?_____
3. What is your BMI?_____
4. What is your blood pressure?_____/_____
5. What is your average HRV?_____

*This section will be completed by researcher

Marital Assessments

-Please mark the box that applies to you-On a scale from 0=Not at all to 10=Extremely

Part I

		0	1	2	3	4	5	6	7	8	9	10
		Not at all										Extremely
1.	Considering the positive qualities of your spouse, *and ignoring the negative ones,* evaluate how positive these qualities are.											
2.	Considering only negative feelings you have towards your spouse, *and ignoring the positive ones,* evaluate how these feelings are.											
3.	Considering the negative qualities of your											

	spouse, *and ignoring the positive ones,* evaluate how negative these qualities are.											
4.	Considering only good feelings you have about your marriage, *and ignoring the bad ones,* evaluate how good these feelings are.											
5.	Considering only positive feelings you have towards your spouse, *and ignoring the negative ones,* evaluate how these feelings are.											
6.	Considering only bad feelings you have about your marriage, *and ignoring the good ones,* evaluate how bad these feelings are.											

Part II

		Extremely Dissatisfied	Very Dissatisfied	Somewhat Dissatisfied	Mixed	Somewhat Satisfied	Very Satisfied	Extremely Satisfied
1.	How satisfied are you with your marriage?							
2.	How satisfied are you with your husband/ wife as a spouse?							
3.	How satisfied are you with your relationship with your husband/wife?							

Part III

1. **Circle the dot on the scale below which best describes the degree of happiness, everything considered, of your present marriage. The middle point, "happy," represents the degree of happiness which most people get from, marriage, and the scale gradually ranges on one side to those few people who are very unhappy in marriage, and on the other, to those few who experience extreme joy or felicity in marriage.**

Very Unhappy **Happy** **Perfectly Happy**

State the approximate extent of agreement or disagreement between you and your mate on the following items. Please check each column.

	Always Agree	**Almost always Agree**	**Occasionally Disagree**	**Frequently Disagree**	**Almost always Disagree**	**Always Disagree**
2. Handling family finances						
3. Matters of recreation						
4. Demonstration of affection						
5. Friends						
6. Sex relations						
7. Conventionality (right, good, or proper conduct)						
8. Philosophy of life						
9. Ways of dealing with in-laws						

Circle One:

10. When disagreements arise, they usually result in:

(a) *Husband giving in* *(b) Wife giving in* *(c) Agreement by mutual give and take*

11. Do you and your mate engage in outside interests together:

(a) *All of them* *(b) Some of them* *(c) Very few of them* *(d) None of them*

12. In leisure time do you generally prefer:

(a) To be "on the go" (b)To stay at home?

13. Do you ever wish you had not married?

(a) *Frequently* *(b) Occasionally* *(c) Rarely* *(d) Never*

14. If you had your life to live over, do you think you would:

(a) *Marry the same person* *(b) Marry a different person* *(c) Not marry at all*

15. Do you confide in your mate:

(a) *Almost never* *(b) Rarely* *(c) In most things* *(d) In everything*

Please check the one response to each item that best describes how you have felt and behaved over your whole life.

1.Have you ever felt you should *cut* down on your drinking?	Yes	No
2. Have people *annoyed* you by criticizing your drinking?	Yes	No
3. Have you ever felt bad or *guilty* about your drinking?	Yes	No
4. Have you ever had a drink first thing in the morning to steady your nerves or get rid of a hangover?	Yes	No