

Department of Behavioral Sciences and Leadership

West Point Resilience Project (WPRP)

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Sleep and Resiliency in Soldiers

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SLEEP AND RESILIENCY IN SOLDIERS

ABSTRACT

The purpose of the proposed study is to determine the relation between sleeping patterns and PTSD. Soldiers that obtain adequate sleep on a regular basis may be more likely to have higher resiliency to the effects of stress than those that have difficulty sleeping. Additionally, Soldiers that have more difficulty sleeping may be more prone to suffer PTSD like symptoms. However, resiliency training may help to moderate the effects of sleep quality on Soldiers. The goals of the proposed study are 1) to develop a way to identify Soldiers that are more susceptible to the effects of PTSD by understanding how well they sleep; 2) understanding which combination of resiliency training is optimal for preventing PTSD and 3) determining if there is an interaction between sleep quality and resiliency training.

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Introduction

The U.S. Army has evolved to deal with most of the stressors of modern war, but there are symptoms that demonstrate that the Army has not figured out how to effectively train Soldiers to be as resilient and hardy as possible to cope with the stresses of modern combat as well as garrison life. The purpose of this paper is to examine the literature to find ways to identify at risk groups of Soldiers so that the Army can devote more of their resources to training these Soldiers to improve their resilience and hardiness so they can potentially experience post traumatic growth (PTG) instead of post traumatic stress disorder (PTSD) after experiencing a traumatic event. Perhaps one of the best methods of identifying a Soldier's likelihood of developing PTSD and other adverse reactions to stress, such as anxiety or depression, is to examine their sleep patterns. The literature indicates that sleep is an important component in normal brain functioning and coping with stress.

Since the overall goal of this project is to increase the resilience of the U.S. Army it is important to have a solid understanding of the concept of resilience. One of the most common definitions of resilience in the PTSD and related literature is "the adult capacity to maintain healthy, symptom-free functioning following PTEs (Potentially Traumatic Events)" (Bonanno, et al., 2006). Resilience to PTEs is an evolving concept as evidenced by the fact that Almedom and Glandon (2007) disagree with the above definition of resilience and claim that "It is evident that resilience is more than the absence of 'posttraumatic stress disorder,' just as health (and indeed mental health) is more than the absence of disease (or mental/behavioral disorder)." For the purpose of this project we will define resilience as effectively coping with PTEs.

PTEs may trigger one of two different outcomes, either a person will experience some form of PTG or psychological symptoms such as those associated with PTSD. PTG is defined as

positive change as a result of a traumatic experience. PTG can include “a feeling of strength, becoming closer to family and friends, or a greater appreciation of life” (Kleim and Ehlers, 2009, pg. 45). The current literature provides evidence that PTG and PTSD are not mutually exclusive. It is possible to experience PTSD symptoms and some PTG or vice versa. Our goal in this project is to find ways to maximize Soldiers’ PTG responses and minimize the adverse effects. Kleim and Ehlers (2009) describe a curvilinear relationship between PTSD and PTG. They argue that there are actually 3 groups of assault survivors: those that experience little growth and little adverse symptoms, those that experience a large amount of adverse symptoms and little growth, and those that experience a large amount of growth and little adverse symptoms.

PTSD

Post traumatic stress disorder is a severe anxiety disorder that can develop after exposure to any event which results in psychological trauma. In order for an event to be stressful enough for PTSD onset there must be a perceived threat of danger to oneself or others. PTSD is not as common as acute stress response. There are many different definitions of what symptoms an individual must experience to have PTSD. There are three main types of PTSD symptoms: 1) re-experiencing symptoms such as intrusive memories, recurring dreams, acting or feeling as if the traumatic event is reoccurring and mental and physical discomfort when reminded of the past event; 2) avoidant symptoms such as avoiding thoughts or memories associated with the event, loss of memory of the traumatic event, reduced interest in activities, feeling disconnected from friends and families, showing a limited range of emotion and having a sense of a failed future, and 3) increased arousal symptoms such as difficulties in concentrating, exaggerated watchfulness, irritability or anger management issues, difficulty falling or staying awake, and being easily startled (Cohen, 2006). Common symptoms of PTSD include frightening thoughts

and night terrors, feeling emotionally numb, anger management issues, and trouble in work or social settings. PTSD often occurs simultaneously with drug and alcohol abuse, anxiety or depression. To a person with PTSD, ordinary events can bring back memories that trigger a flashback making the person suffering from PTSD believe they are re-experiencing the traumatic event. (Cohen, 2006)

PTSD is a relatively young disorder in terms of its diagnosis. However PTSD can be traced back to the concept of “battle fatigue” or “shell shock” as early as the American Civil War. The cohort with the most likely reason for developing PTSD is military personnel in combat situations; however, PTSD is also commonly seen in emergency services personnel, victims of rape or kidnappings, car crash victims and other traumatic experience victims.

Hardiness

One aspect of resilience is known as hardiness. Britt et al. (2001) states, “In theoretical terms, hardiness has been defined as a dispositional tendency to find meaning in events, particularly stressful events that challenge the individual” (p. 54). Research shows that people with hardiness are able to look at a stressful situation as a challenge that can be overcome leading to higher resilience to the effects of the stress. Britt et al. (2001) found that hardiness came from how much meaning Soldiers found in their work. The results of their study showed that Soldiers who were more hardy or thought their peace keeping deployment had meaning suffered significantly less from the effects of stress. However, what does it take to have hardiness? Maddi (2002), states that there are 3 C’s that one must possess to have true hardiness: commitment, control, and challenge. It is important to have all three to possess true hardiness because without one trait, one might have trouble interacting with people or taking charge of the situation. People are far more likely to possess hardiness if they are surrounded by those that

possess hardiness traits (Khoshaba, & Maddi, 1999a). One source that has been shown to create hardiness in people is religion. One study showed that those with more spirituality tended to have more courage and motivation in tough situations and as a result they tended to show elevated levels of hardiness (Maddi et al., 2006). Studies also indicate that hardiness is inconsistent and situation dependent. Maddi (1999) describes it as “moment-to moment sense of commitment, control, and challenge” (p. 92). There are stressful situations in civilian life that have much in common with those of life in the military, “such as when nurses regularly confront death and dying in hospice settings, or when statistical consultants experience culture shock in their work overseas” (Maddi, 2005, p. 261). The similarity between these situations and military experiences led researchers to study the effects of hardiness on Soldiers in combat. Bartone (1999) conducted a study on Soldiers from Operation Desert Storm to observe the interaction of stress and hardiness in relation to health problems. The study showed that those Soldiers that possessed hardiness showed significantly fewer symptoms of health issues or reactionary problems to stress. These studies show that the ability to take a stressful situation and view it as a puzzle to solve or a challenge to overcome (hardiness) is an important tool to prevent adverse effects of stress to include anxiety, depression, and PTSD. Hardiness is an important concept to understand when analyzing methods to treat or prevent PTSD.

Post Traumatic Growth (PTG)

While some walk away from a traumatic event with a negative side effect such as anxiety, depression, or PTSD, others walk away from that same event with post traumatic growth (PTG). People that seem to appreciate life even more or feel that they survived for a reason experience PTG. Everly & Lating (2004) state that there are five worldviews that have a relevance to understanding trauma:

1. The belief in a fair and just world
2. The need to for attachment to, and trust in, others
3. The need for physical safety
4. The need for a positive self-identity and view of oneself-in other words, self –esteem, self-efficacy
5. The belief in some overarching meaning or order to life-for example, religion, spirituality, or faith in a defining order, unifying paradigm, and so forth (p. 37).

A traumatic event is when one of these 5 worldviews is called into question. That person may no longer believe the world is just or trust others. The questioning of these world views may come in the form of anxiety, depression, self medicating behaviors, or PTSD. PTG occurs when one or more of these world views are enhanced. That person may have a stronger attachment to others, feel indestructible, or have a stronger faith in God. These are just a few examples of PTG. It is important to understand that just because a person experiences PTG after one traumatic event, does not mean that they experience it after every traumatic experience. “Because the development of PTG appears to be a long-term process in many persons, there are likely to be times when the possibility of PTG is unrecognized and even unwelcome. Psychological pain and physical distress may be initially overwhelming, preventing a patient from appreciating anything relating to the notion of PTG. In some situations, acknowledgment of PTG may seem to be a sort of betrayal” (Tedeschi & Calhoun, 2007, p.220). In this study it is important to understand that just because someone’s sleeping patterns may suggest resiliency that does not mean that they are immune to stress and its negative side effects. There still is and always will be a possibility that a Soldier may have an experience that causes them to suffer from negative side effects. On

the other end of the spectrum, just because one is flagged as being at risk for PTSD does not mean that they cannot receive training to improve their ability to cope with stress.

Sleep Deprivation & Stress

The link between PTSD and sleep comes from the understanding that sleep is crucial to healthy brain functioning. Therefore a PTSD damaged brain may have sleep issues. Also, a symptom of PTSD is flashbacks, and nightmares can be a form of flashbacks (Kramer, 1990). We hypothesize that Soldiers who sleep better during training are less likely to develop PTSD in combat situations than those Soldiers who do not sleep well during training. This leads to the question of what constitutes good or effective sleep. The optimal amount of sleep for most adults is around 7 or 8 hours per day (National Sleep Foundation (NSF)). When Soldiers are in intense training or are deployed they do not always obtain this much sleep. The amount of sleep they get each night will become more important the longer Soldiers are deployed. Sleep debts occur when people do not get enough sleep; however scientists do not agree on the maximum amount of sleep debt a person can accumulate nor how long it takes someone to recover from lack of sleep. Sleep patterns are also very important. People that stay up until midnight and then sleep later into the day are actually getting worse sleep than people that get to bed earlier. Napping during the day will sometimes have positive effects in refocusing a person and helping them to feel less tired; however, napping can also make people feel more tired even though they were just resting (NSF). The timing of sleep is critical, therefore it is important for us to examine the time that Soldiers sleep in our study as well as their average amount of sleep per night. According to Zammit, the four main determinates of sleep patterns are circadian rhythms, age, gender, and prior sleep debt.

Sleep deprivation is an obstacle that Soldiers have to overcome during training and missions. Sleep deprivation can be described as either partial or total sleep deprivation. Total sleep deprivation would be getting no sleep in a 24 hour period. Partial sleep deprivation is more common and can be defined as getting only 6 hours of sleep or less. Sleep deprivation can lead to decrements in performance similar to the performance seen in intoxicated individuals. (Weinger & Israel, 2002) Sleep deprivation also impairs the body's natural ability to heal itself. This effect is especially seen in the brain. When Soldiers are deployed they will likely be suffering from sleep deprivation which may lead to increased rates of PTSD in Soldiers. By studying the amount of time Soldiers sleep in garrison and during training such as Ranger school, JRTC, or NTC, one can potentially predict how Soldiers will respond to the limited amount of time they have to rest in combat. People suffering from PTSD may report sleep disturbances or nightmares as a symptom that they experience (Inman et al., 1990). Sleep disturbances or nightmares generally occur during REM phases of sleep. REM sleep occurs more at the end of the sleep cycle than the beginning. People are more likely to wake up when in REM sleep and are at a more alert state in REM sleep than in the other phases of the sleep cycle. These sleep disturbances likely exacerbates the PTSD that people suffering from both PTSD and sleep disturbances experience. Studies show that people suffering from sleep disturbances are more psychologically troubled and more responsive to their dreams than normal dreamers. (Inman et al., 1990).

In summary, sleep and PTSD appear to be correlated; however, further research needs to be done to understand the amount of sleep a PTSD patient obtained prior to the PTE as well as the amount of sleep they obtain during the recovery process. Research should also focus on determining if there is a change in sleep patterns before and after a patient develops PTSD.

Proposed Study Method

Participants

Participants for this research study will be Soldiers from the United States Army assigned to one of eight brigades. The participants will rank from Junior Enlisted to Field Grade officers from all eight brigades. They will come from one of four groups: Group 1 (Interaction Group) from 1st and 3rd BDE 4th ID, Group 2 (MRT Group) from 1st BDE 25th ID and 2nd BDE 1st ID, Group 3 (CRM Group) from 3rd BDE 1st ID and 170th HBCT, and Group 4 (Control Group) from 2nd BDE 4th ID and 11th ACR. These groups were divided by the Comprehensive Soldier Fitness (CSF) program. The purpose of the division will be discussed later in this report in the discussion section.

Apparatus

Sleep will be monitored using a motion detection bracelet called an Actiwatch (Philips, Respironics, 2009) to determine their sleeping cycles. These watches cost around \$60 a piece and require little effort to operate. Soldiers will wear this bracelet 24/7 for 2 weeks.

Procedures

To select the participants we will first divide them into groups within each brigade based on rank; Junior Enlisted, Junior NCOs, Senior NCOs, Company Grade Officers, and Field Grade Officers. Junior Enlisted consists of privates and specialists; they typically hold no position in the Chain of Command (CoC) and focus on their individual task. Since this is the largest group we will select a random sampling of 40 Soldiers. Junior NCOs includes Corporals, Sergeants, and Staff Sergeants. They typically hold the position of Team leader and Squad leader. This being the second largest group we would select a random sample of 40. Senior NCOs consisting of Sergeants first class, 1st Sergeants, and Command Sergeant Majors (CSM). They typically

hold the position of platoon sergeants (PSG), 1st Sergeant (1SGT), and battalion/brigade CSM. Of the enlisted personnel, this group is the smallest; since there are more PSGs we could take a sample of 50% of the PSG in the brigade and observe all 1SGTs and CSMs. Company grade officers consist of 2nd/1st Lieutenants (Lt) and Captains (CPT). They typically are the Platoon leaders (PL), company commanders (Co), company executive officers (XO), or hold staff positions. Since the officer groups are smaller than the NCO groups, we would randomly select 50% of the company grade officers. The last group, Field grade officers, consist of Majors (MAJ), Lieutenant Colonel (LTC), and Colonel (COL). They typically are the S3s, Battalion XO, Battalion commanders (BN CO), or Brigade commanders (BGD CO). Since there very few field grade officers in a brigade we would sample all of the field grade officers. We want to sample the entire spectrum of ranks in a brigade because everyone is exposed to some form of stress from a Private to the Brigade Commander. Sampling the entire spectrum will allow us to study the effects of these different stress at all levels of the CoC.

Once we have selected the individuals for the study we would issue them a special bracelet that monitors the movement of their arm called an Actiwatch. We will have them wear this watch for a duration of two weeks. Based on the movement of their arm we will know when they are sleeping. When a Soldier is awake the movement of the arm is high compared to when the Soldier is asleep, since there is little to no movement. As shown in figure 1.

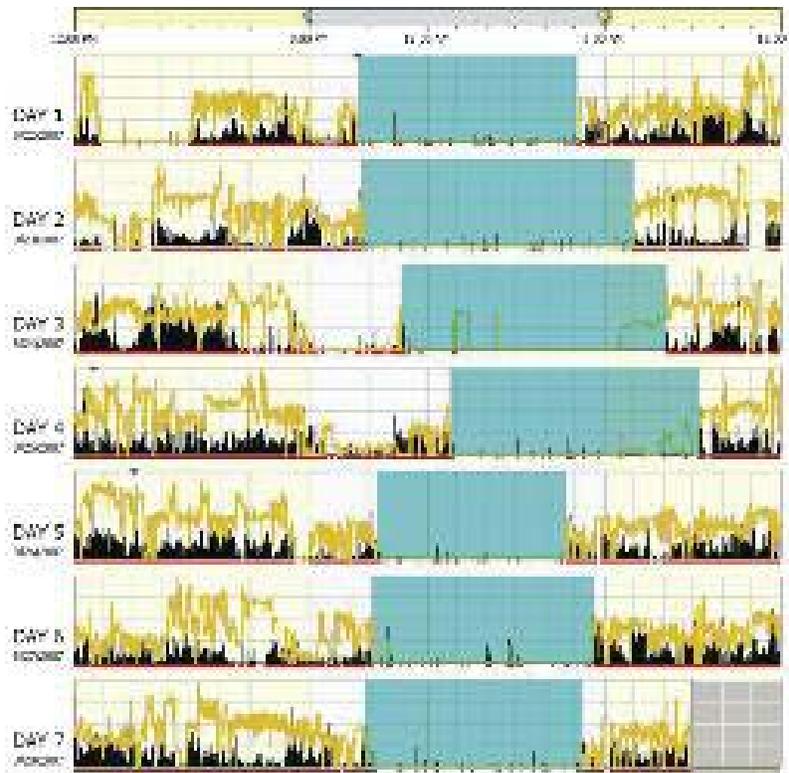


Figure 1

The black represents movement of the wrist; the blue shaded area represents duration of sleep suggested by the lack of wrist movement (Philips Respironics, 2009). The goal is to analyze the duration of the sleep periods, the quality of the sleep based on the number of interruptions during the sleep cycle, number of naps taken on average per day, and percent of time sleeping out of the time allotted. The latter would tell us more about if the Soldier is having trouble sleeping due to tossing and turning all night. Actiwatch data will be collected at three time points: pre-deployment, during deployment and post-deployment to assess sleep changes over time.

Discussion

It is expected that sleeping patterns in Soldiers will mirror the same bell curve as resiliency as shown in figure 2. The lowest percentile (red) represents those that are very

susceptible to PTSD, experiencing the worst symptoms, and have much difficulty sleeping on a regular basis. The next higher percentile (orange) represents Soldiers that are susceptible to PTSD but with milder symptoms and have some difficulty sleeping. The 50% area (yellow) represents the average Soldier with average reactions to stress and average sleeping patterns. The next higher percentile group represents those that have rather high resiliency to PTSD and little trouble ever falling asleep. The final and highest percentile group would be those Soldiers that experience some PTG as a result of exposure to stress and rarely have difficulty sleeping.

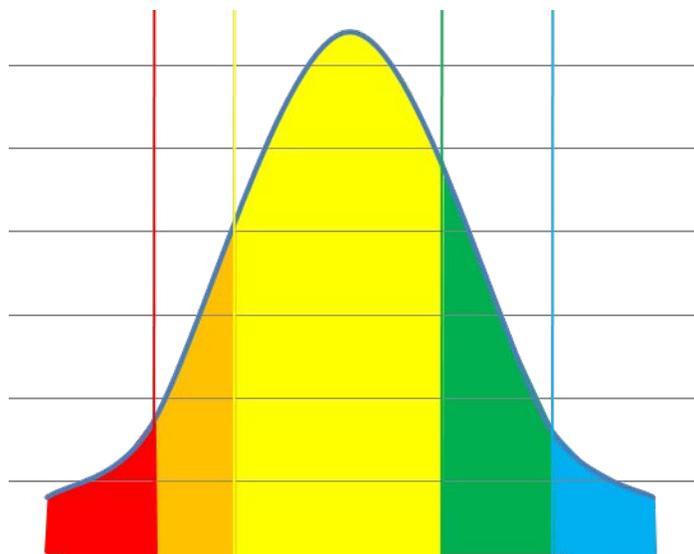


Figure 2

This study also gives us an opportunity to provide feedback as to how effective the different resiliency trainings are as part of the new Comprehensive Soldier Fitness (CSF) program. Currently the CSF program is assessing what training Soldiers should receive to help cope with stress and reduce the risk of PTSD. The current study is looking at the Global Assessment Tool (GAT), Master Resilience Training (MRT), and Comprehensive Resilience Modules - online training modules via live training (CRM). Group one is the interaction group where the Soldiers receive the GAT, CRM, and MRT. Group two is the MRT group where

Soldiers receive GAT and MRT. Group three is the CRM group where Soldiers receive the GAT and CRM. The final group, group four, is the control group where Soldiers will only receive the GAT. We will use the metric set by CSF to measure PTSD. The idea of the study is to observe which combination of resiliency training is optimal for preventing PTSD. We hypothesize that due to the relationship between sleep disorders and PTSD that the group that tends to have relatively better sleeping patterns will be less susceptible to PTSD. Additionally, there may be an interaction between resiliency training and sleep such that the group that has better sleeping patterns is receiving the optimal training for resiliency and thus will be less susceptible to PTSD due to the buffering effects of the training.

Conclusion and Future Research Directions

In today's fight, sleep is a difficult commodity to get at times. Soldiers can go up to 72+ hours straight without any sleep. That plus the many stresses occurring from combat operations can take a toll on human performance over time. Sleep and PTSD appear to have a strong relationship, the more sleep a person receives, the more likely they will be able to resist the adverse affects of stress, to include PTSD. Conducting this study would not only provide strong insight into resiliency to PTSD, but also into the effectiveness of the military's training programs designed to ameliorate the effects of PTSD. If we are able to improve how well Soldiers are sleeping at night, this may be due to the CSF training. The ability to release stress in a healthy way and get a good night's sleep is sometimes all it takes to prevent the long term effects of stress.

Annotated References

Almedom, A., & Glandon, D. (2007). Resilience is not the absence of PTSD any more than health is the absence of disease. *Journal of Loss & Trauma, 12*(2), 127-143. doi:10.1080/15325020600945962.

This article reviews the literature on resilience which may be described in numerous ways such as a process, an outcome or a dynamic steady state in the face of adversity. Resilience is multidimensional in nature and is not simply the absence of a disorder. Due to its complexity, both qualitative and quantitative measures should be considered when describing resilience.

Bartone, P., Eid, J., Johnsen, B., Laberg, J., & Snook, S. (2009). Big five personality factors, hardiness, and social judgment as predictors of leader performance. *Leadership & Organization Development Journal, 30*(6), 498-521. doi:10.1108/01437730910981908.

The purpose of this paper is to evaluate the influence of psychological hardiness, social judgment, and "Big Five" personality dimensions on leader performance in U.S. military academy cadets at West Point. The authors measured leader performance with leadership grades aggregated over 4 years at West Point. This study found ways to predict cadet performance.

Bartone, P. (1999). Hardiness protects against war-related stress in Army Reserve forces. *Consulting Psychology Journal: Practice and Research, 51*(2), 72-82. doi:10.1037/1061-4087.51.2.72.

Abstract: As active-duty forces continue to shrink in the post-Cold War military, reserve and National Guard units play an increasingly important role in deployments of all types. When mobilized for deployment, reservists may experience a range of major life stressors in addition to the stressors encountered in the area of military operations. Although previous studies show ill effects of stress on some of these personnel, few studies have sought to explain the continued good health and stress resiliency displayed by the majority of veterans. This study examined personality hardiness as a potential protective variable among Army reserve personnel mobilized for the Persian Gulf War. Regression results showed hardiness interacted with both combat-related stress and stressful life events to predict psychiatric symptoms on several measures. The pattern of results suggested hardiness protects against the ill effects of stress, particularly under high- and multiple-stress conditions. These results have implications for preventing the ill effects of stress across a variety of occupations that can expose workers to multiple stressors, including job disruption and family separation.

Britt, T., Adler, A., & Bartone, P. (2001). Deriving benefits from stressful events: The role of engagement in meaningful work and hardiness. *Journal of Occupational Health Psychology, 6*(1), 53-63. doi:10.1037/1076-8998.6.1.53.

Abstract: This research explored the relationship between the meaningfulness of work, personality hardiness, and deriving long-term benefits from a stressful event. U.S. Soldiers participating in a peacekeeping mission to Bosnia completed measures assessing the meaning of their work and personality hardiness midway through a 1-year deployment (mid-deployment) and completed a measure of deriving benefits from the deployment 4 -5 months after it was over (postdeployment). Structural equation modeling revealed that personality hardiness was associated with being engaged in meaningful work during the deployment, which was strongly associated with deriving benefits from the deployment months after it was over. Enriching experiences were also associated with deriving benefits from the deployment. Discussion focuses on the linkages between personality processes, meaningful work, and deriving benefits from a stressful experience.

Bonanno, G., Galea, S., Bucciarelli, A., & Vlahov, D. (2006). Psychological resilience after disaster. *Psychological Science, 17*(3), 181-186. doi:10.1111/j.1467-9280.2006.01682.x.

Abstract: Research on adult reactions to potentially traumatic events has focused almost exclusively on posttraumatic stress disorder (PTSD). Although there has been relatively little research on the absence of trauma symptoms, the available evidence suggests that resilience following such events may be more prevalent than previously believed. This study examined the prevalence of resilience, defined as having either no PTSD symptoms or one symptom, among a large (n = 2,752) probability sample of New York area residents during the 6 months following the September 11th terrorist attack. Although many respondents met criteria for PTSD, particularly when exposure was high, resilience was observed in 65.1% of the sample. Resilience was less prevalent among more highly exposed individuals, but the frequency of resilience never fell below one third even among the exposure groups with the most dramatic elevations in PTSD.

Cohen, H. (2006). Who is typically diagnosed with PTSD? Retrieved from <http://psychcentral.com/lib/2006/who-is-typically-diagnosed-with-ptsd/>

Author discusses the causes, symptoms, diagnosis and treatment of PTSD.

Everly, G., & Lating, J. (2004). The Defining Moment of Psychological Trauma: What Makes a Traumatic Event Traumatic?. *Personality-guided therapy for posttraumatic stress disorder* (pp. 33-51). American Psychological Association. doi:10.1037/10649-003.

This article provided 5 world views of trauma. It discusses the potentially negative psychological results when one's world view is violated.

Inman, D. J., Silver, S. M., & Doghramji, K. (1990). Sleep disturbance in post-traumatic stress disorder: A comparison with non-PTSD insomnia. *Journal of Traumatic Stress, 3*(3), 429-437.

This study utilized a questionnaire to compare sleep disturbances in Vietnam War combat veterans having PTSD with non-PTSD patients having insomnia without other PTSD symptoms. The PTSD group reported symptoms of anxiety, agitation and concurrent body movement which were associated with insomnia. Nightmares of this group were more repetitive and more disruptive of a return to sleep than they were for the non-PTSD insomnia group. The PTSD group also reported more fatigue during daytime functioning and more anxiety during waking hours than the non-PTSD insomnia group.

Khoshaba, D. M., & Maddi, S. R. (1999a). Early experiences in hardiness development. *Consulting Psychology Journal, 51*, 106–116.

This study tested hypotheses implicating stresses, compensatory family standards, self-perception, and parental stimulation as formative influences for hardiness in adulthood. Responses to life review interview questions given by managers previously selected to be low or high in hardiness were coded blind for the early experience variables hypothesized. The study demonstrated adequate interscorer agreement on early experience coding.

Kleim, B. & Ehlers, A. (2009). Evidence for a curvilinear relationship between posttraumatic growth and posttrauma depression and PTSD in assault survivors. *Journal of Traumatic Stress, 22*(1), 45-52.

The authors found a curvilinear relationship between PTSD and PTG. They argue that there are actually 3 groups of assault survivors: those that experience little growth and little adverse symptoms, those that experience a large amount of adverse symptoms and little growth, and those that experience a large amount of growth and little adverse symptoms.

Kramer, M. (1990). Nightmares (dream disturbances) in posttraumatic stress disorder: Implications for a theory of dreaming. *Sleep and cognition* (pp. 190-202). American Psychological Association. doi:10.1037/10499-014.

In this article Kramer describes theories of sleep and dreams then discusses nightmares in PTSD. This article provides a reader with a solid understanding of the link between good sleep and PTSD recovery or nightmares exacerbating PTSD. Kramer describes the sleep cycle and dream patterns in depth.

Maddi, S., Brow, M., Khoshaba, D., & Vaitkus, M. (2006). Relationship of hardiness and religiousness to depression and anger. *Consulting Psychology Journal: Practice and Research*, 58(3), 148-161. doi:10.1037/1065-9293.58.3.148.

Abstract: Both hardiness and religiousness share spirituality, in the sense of searching for meaning in one's life, and have been shown to have a buffering effect on stresses that maintains and enhances performance, morale, and health. This study investigates how hardiness and religiousness compare in their relationship to depression, anger, and the coping and social support mechanisms whereby they may have these relationships. Participants were military and governmental personnel who completed accepted measures of hardiness, religiousness, and other variables on a volunteer basis. Correlational and multiple regression analyses showed that, by comparison with religiousness, hardiness has the larger and more comprehensive negative relationship with depression and anger, and positive relationship with coping and social support. The conceptual and empirical implications of these findings are discussed.

Maddi, S. (2005). On hardiness and other pathways to resilience. *American Psychologist*, 60(3), 261-262. doi:10.1037/0003-066X.60.3.261.

This article gave strong insight into the relation between hardiness and resilience. It discussed what hardiness is and the effects it has with regard to stress.

Maddi, S. (2002). The story of hardiness: Twenty years of theorizing, research, and practice. *Consulting Psychology Journal: Practice and Research*, 54(3), 173-185. doi:10.1037/1061-4087.54.3.173.

Abstract: Since 1979, the development of the hardiness approach to enhancing performance and health has been facilitated by continual cross-fertilization between theorizing, research, and practice. At first, hardiness emerged from individual differences research on stress reactions as the attitudes of commitment, control, and challenge. Since then, extensive theorizing and practice, combined with considerable additional research, has led to the supplementation of hardy attitudes with hardy skills concerning coping, social interaction, and self-care. Also, the mechanisms whereby hardy attitudes and skills enhance performance and health are better understood. The hardiness approach has also expanded from the individual to the organizational level. All these developments form an example of the value of combining theorizing, research, and practice.

Maddi, S. (1999). The personality construct of hardiness: I: Effects on experiencing, coping, and strain. *Consulting Psychology Journal: Practice and Research*, 51(2), 83-94. doi:10.1037/1061-4087.51.2.83.

This article furthers the construct validity of hardiness by determining the role of hardiness in moment-to-moment experiencing, coping, and strain reactions. The 1st study showed that the higher the hardiness level as measured by the Personal Views Survey II, the greater the tendency, with regard to one's activities, to enjoy them (commitment), feel that you have chosen them (control), and sense that you are learning through them (challenge). The 2nd study showed that the tendency for work stressors to elicit more transformational (hardy) coping is intensified by hardiness levels. Further, this study found that regressive (avoidance) coping is unrelated to event context but negatively related to hardiness. The 3rd study provided evidence that hardiness is negatively related to both self-report (checklist) and objective (blood pressure) measures of organismic strain.

National Sleep Foundation. How much sleep do adults need. Napping. Retrieved from <http://www.sleepfoundation.org/>.

Site provides information on sleep and sleep disorders.

Philips Respironics (2009). Twice as easy: Ambulatory actigraphy devices that collect and download continuous objective long-term sleep/wake data. Retrieved from <http://www.actiwatch.respironics.com/pdf/ Twice%20as%20Easy%20brochure%20final.pdf>

Brochure that provides an overview of their Actiwatch.

Tedeschi, R. & Calhoun, L. (2007). The clinician as expert companion. *Medical illness and positive life change: Can crisis lead to personal transformation?* (pp. 215-235). American Psychological Association. doi:10.1037/11854-012.

This article explained how PTG is not always consistent. How one person may experience PTG from one event and PTSD from another. It went on to discuss different myths about PTG.

Weinger, Matthew B. & Ancoli-Israel, Sonia (2002). Sleep Deprivation and Clinical Performance. *JAMA*. 287(8). 955-957.

In this study Weinger and Ancoli-Israel describe the effects of sleep deprivation on the performance of physicians. They describe the basics of sleep deprivation. They also delve into studies suggesting that a physician's performance degrades over time and describe the level of sleep deprivation that is similar to legal intoxication in individuals. They recommend that physicians be limited to 12 hour shifts for the safety of the patients.

Zammit, G. (1997). Delayed sleep phase syndrome and related conditions. *Understanding sleep: The evaluation and treatment of sleep disorders* (pp. 229-248). American Psychological Association. doi:10.1037/10233-011.

In this article Zammit discusses the 24 hour circadian rhythm cycle. He then describes the physical, physiological, and psychological issues that lead to sleep disorders. He describes one of the most common sleeping disorders, insomnia in great detail. Additionally, the article includes a discussion on delayed sleep phase syndrome which could be present in many patients suffering from PTSD.