A Review of Various Medical Illnesses and their Relationship with PTSD

Jennifer E. Fennell

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Posttraumatic stress disorder is related to physiological symptoms and health problems. This review will evaluate three psychophysiological models – the attentional mechanism model, the general adaptation syndrome, and the health belief model - to explain the processes involved in the relationship between posttraumatic stress disorder and physiological illnesses. Posttraumatic stress disorder will be highlighted as a disorder that is related to cardiac and nervous system dysfunction, immunological and musculoskeletal problems, and various other physiological problems. It will support the models and increase awareness of the relationship between medical symptoms and posttraumatic stress disorder. Increased understanding may improve screening methods in health care settings, across multiple disciplines, resulting in greater accuracy in diagnosing posttraumatic stress disorder and more efficient and comprehensive treatments.
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This Clinical Research Project by Jennifer E. Fennell, directed and approved by the candidate’s Clinical Research Project Committee, was approved by the faculty of Argosy University Atlanta in partial fulfillment of the requirements of the degree of Doctor of Psychology in Clinical Psychology.

Timothy C. Brown, PhD.
Program Chair, Clinical Psychology

(September 12, 2008)

Clinical Research Project Committee:

(Virginia Goetsch, Ph.D.)
Chair

(Kaprice Thomas, J.D., Ph.D.)
Committee Member
Dedication

This Clinical Research Project is dedicated to my husband, Stephen E. Fennell. You have made so many things possible in my life. You have walked through this journey with me all of the way - holding my hand, pushing me along, and at times even carrying me. You have clearly earned your “honorary doctorate” in clinical psychology with me. You truly are my “Angel.” Thanks you for having my back!
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Review of Various Medical Illnesses and their Relationship with PTSD

This research review (hereinafter, the “Review”) underscores the relationship shared between posttraumatic stress disorder (“PTSD”), physiological symptoms, and health problems. An extensive search was completed utilizing psychology, sociology, and medical literature reviews, books, and journals in order to examine the shared relationship. The research conducted to support this Review found that while there is a wealth of research linking PTSD to health problems, there is a limited amount of research on specific illnesses and their relationship with PTSD. This review will synthesize the evidence in an attempt to demonstrate and support that a relationship exists between PTSD and health problems and specific illnesses.

Psychophysiological models substantiate the relationship between physiological and mental responses to stress. In order to review the evidence linking PTSD, physiological symptoms and health problems, three psychophysiological models – the attentional mechanisms model, the general adaptation syndrome, and the health belief model have been reviewed.

According to the DSM-IV-TR (American Psychiatric Association, 2000), PTSD occurs when a person has experienced a trauma which they perceive to be a threat to themselves or others close to them. The trauma invokes feelings of fear and helplessness. The DSM-IV-TR (American Psychiatric Association, 2000) PTSD is characterized by symptoms of re-experiencing the trauma, hyperarousal, and avoidance. In order to be diagnosed as PTSD, the symptoms must persist for more than one month and cause marked distress in social, vocational, or personal functioning. In the first month following the trauma, this constellation of symptoms is usually diagnosed as acute stress disorder. PTSD and acute stress disorder are classified in the DSM-IV-TR as anxiety disorders.
The symptoms and subsequent diagnosis of PTSD do not discriminate against gender, race, and socioeconomic status. “An estimated seventy percent (70%) of adults in the United States have experienced a traumatic event at least once in their lives, and up to twenty percent (20%) of these people go on to develop Posttraumatic Stress Disorder, or PTSD” (http://www.ptsdalliance.org/about_what.html, 2007). In fact, a United States Department of Commerce study in 2000 determined that out of a population of 281,421,906 people, approximately 39,399,097 had PTSD. With such a large number of affected individuals, it is important for health care professionals to be familiar with the symptoms of PTSD in the population. Appreciation of the prevalence of PTSD, understanding of its presentation and the physiological relationship shared will ultimately influence diagnosis and treatment.

Due to the impact of prolonged stress on physiological health, awareness of the relationship PTSD shares with other physiological disorders is critical. Because PTSD mirrors other anxiety disorders and has a negative impact on ones ability to function, early detection is important. PTSD diagnosis requires an in-depth clinical interview during which the associated symptoms are unveiled and acknowledged.

Finally, based on the research amassed to date, the Review will support the theory that there is a relationship between PTSD and physiological illness. This appreciation of the correlation between PTSD and physiological illnesses will positively impact treatment and treatment success rates in the future. Through awareness of the relationship, PTSD will be viewed and understood more clearly across clinical professions.

Psychological Distress and Physiology

The link between prolonged psychological distress and physiological health has been extensively researched. Three psychophysiological models – the attentional mechanism model,
the general adaptation syndrome (GAS), and the health belief model (HBM) are frequently used to explain the relationship between medical conditions and PTSD. Each of these models explains the negative relationship between trauma, physiological symptoms, and health problems. The Review will explore the models being used to explain the relationship between PTSD and physiological illness. Understanding these models will assist in conceptualizing PTSD as a psychological disorder that has an important connection to the physiological illnesses that occur concurrently with its diagnosis.

Attentional Mechanism Model

According to Schnurr (2004), the attentional mechanism model utilizes four sources to explain the somatic symptoms reported by trauma survivors. The four sources include: 1) true biological changes as the result of exposure to traumatic events; 2) reporting physiological symptoms to avoid the thought of the trauma; 3) mislabeling of physiological and emotional symptoms in order to suppress thinking about the trauma; and 4) eliciting help and seeking attention from others for gain. The attentional mechanism model sheds light on the possible physical health problems related to PTSD by explaining the somatic symptoms reported in survivors.

Several different types of traumas result in true biological changes. This supports the first source of the theory of the attentional mechanism model. True biological changes may occur from traumas resulting from bodily injury (i.e., wounds and broken bones) or exposure to agents resulting in bodily injury (i.e., poisons, sexually transmitted diseases, and infection).

Despite the fact that some traumas produce no direct biological changes, survivors may nonetheless still report somatic symptoms. This “reporting” substantiates the second and third sources of somatic symptoms in the attentional mechanism model, avoidance and mislabeling.
Individuals may present to their primary care physicians and the emergency room complaining of physiological symptoms, without discussing their trauma. Reporting a physiological symptom in an effort to avoid the thought of the trauma is a form of avoidance, which is a symptom of PTSD. By focusing on the physiological symptoms, the trauma survivor is able to avoid the psychological distress of the trauma itself. Mislabeling of autonomic and emotional consequences may also be a form of avoidance. This form of avoidance is known as suppression. By mislabeling autonomic consequences of their trauma, individuals are able to suppress the emotional consequences while not discounting its occurrence. Mislabeling may also be a misunderstanding of the physiological symptoms experienced.

Trauma exposure initially results in true physiological arousal; however, after the threat or perceived threat has passed, the individual may remain aroused. This arousal may cause individuals to seek medical attention. Consequently, the resulting physiological symptoms may mask the trauma itself. According to the attentional mechanism model, reporting physiological symptoms may be an attempt to elicit attention and assistance from others. For some trauma survivors their level of hyperarousal may result in hypersensitivity to somatic symptoms resulting in additional reports of illness. For example, an individual could present to the hospital complaining of having had a heart attack when in actuality it was the physiological arousal from the trauma that simply manifested itself though an increased heart rate or prolonged shortness of breath. For some, the secondary gain of connecting with others socially is achieved by making false reports of illnesses or exaggerating symptoms.

Awareness of how this attentional model may be represented in the research is critical in identifying if it can be used to explain the relationship between PTSD and physiological illness. The attentional mechanism model relies heavily on the trauma survivor’s perception of their
illness and can be measured through examination of personality characteristics and traits. Inferences can be made about the attentional mechanism model being involved based on measures such as utilization of health care, alcohol use as an avoidance strategy, and number of illnesses reported. Individuals with PTSD and related physiological illness may utilize the health care system more often than individuals without PTSD due to mislabeling and misattribution of their physical illnesses or attention seeking. In clinical samples participants may also report more physical illnesses for similar reasons. Participants in studies may engage in alcohol and substance abuse in an attempt to avoid their trauma. This is notable because of the direct link between alcohol and substance abuse increasing illness development and disease vulnerability. Kessler, Sonnega, Bromet, Hughes, and Nelson (1995), found that individuals with PTSD were significantly more likely than individuals without PTSD to meet criteria for alcohol abuse or dependence. Research has also shown that alcohol consumption impacts the health of those diagnosed with PTSD; contributing to diseases of the endocrine, cardiovascular, hematopoietic, gastrointestinal, and nervous systems; heart and lung disease, and cancer (Schnurr & Spiro, 1999; Wetterling, Veltrup, Driessen, & John, 1999).

**General Adaptation Syndrome**

Hans Selye (1954) defined the General Adaptation Syndrome (GAS) to explain the series of events that occurs physiologically in response to a trauma. GAS is a process by which the body attempts to achieve stability or homeostasis following trauma exposure and prolonged stress. GAS produces neurological and hormonal changes which, over time, create chronic illnesses. GAS is similar to a process called allostasis. The phases of GAS are analogous to allostatic states of sustained physiological changes or diseases. “In other words, sustained allostatic load can lead to medical illness” (Freidman, 2004, p.158). GAS focuses on measurable
physiological chemical changes and individual chronic, maladaptive responses to trauma and hyperarousal to explain how allostatic load can lead to physiological illness.

The first stage of GAS is called the alarm reaction. This stage is necessary to help the body respond to the trauma that it has experienced. Sometimes, individuals’ bodies do not recover from the alarm reaction stage. When this occurs, the individual remains in extreme arousal and there is constant physical stress on the body. Increased physiological arousal has been linked to immune system disorders. If the first stage is not successfully resolved, the body enters a second stage: this second stage is called resistance. In the resistance stage, an individual’s body attempts to adapt to the prolonged and intense trauma. In attempting to adapt to the prolonged physiological distress, the body’s energy reserves are slowly, but continually, depleted. When the body finally exhausts all of its energy reserves, the body enters into the third, and final, stage: exhaustion. It is here where disease and death frequently manifest themselves.

In research, this particular model is measurable directly through quantitative measures. This model proposes that continuous stress is the catalyst for disease development. Stress can be measured through cortisol and adrenaline measurements over time. The GAS model is identified through biological changes that occur due to the impact of trauma and stress. These changes can be measured through blood pressure, hypothalamic functioning, functional magnetic resonance imaging, and other hormonal and neurological changes.

Health Belief Model

Disease is also influenced by lifestyle choices as well as psychological illnesses. Disorders such as depression and PTSD greatly impact self-care which can inadvertently impact physiological health. The Health Belief Model (HBM) looks at an individuals’ health habits as
well as the individuals’ perception of their health and ability to influence health outcome. For example, “patients with depression may be more likely to feel susceptible to future disease or less likely to believe they can change their level of risk” (Ford, 2004, p. 88). HBM attempts to explain why there are such a large number of individuals who are non-compliant with health care treatment directives and who continually refuse to engage in behaviors such as exercise or eating balanced meals, which could decrease their vulnerability to physiological illnesses. When individuals are diagnosed with PTSD, this destructive behavior and negative belief system may influence the physiological illnesses observed and diagnosed. In research, participants with PTSD will demonstrate poor health habits more than participants without PTSD.

Conclusion

Through appreciation of the symptoms associated with these models, a foundation can be laid to start understanding the relationship between the trauma and physiological illness. The attentional mechanism model explains the relationship in four parts. The parts describe how trauma symptoms such as avoidance, hyperarousal, and social impairment relate to real, exaggerated, and mislabeled physiological symptoms. The attentional mechanism model can be used to explain the process involved in the relationship between PTSD and physiological illness, by examining how these four parts are represented in clinical samples. GAS explains the short-term and long-term physiological affects of trauma as the body attempts to undergo allostasis, which can be measured quantitatively through biological and hormonal changes. The HBM explains how psychological disorders, such as PTSD, increase health risk behaviors. The increase in risk behaviors, such as smoking and substance abuse, in return adversely affect physiological health. All of these models can be used to explain the physiological illnesses
associated with trauma exposure. Awareness of these models will aid in the understanding of the process by which PTSD influences physiological illness and physical and mental health.

Physiological Illness Relationship with PTSD

The Review will dissect various studies and show how each study supports the relationship between PTSD and physiological illness based on one or more of the models previously discussed. The Review identifies specific diseases and various health illnesses related to PTSD. Conceptualizing, diagnosing, and treating PTSD will be accomplished with greater competence if this relationship is understood and identified.

PTSD research has grown more expansive over the past 30 years. In the 1980s and 1990s, the research yielded results that furthered the understanding of PTSD, however, because the focus was only on the armed services’ veteran population, the results were limited in that they were not comprehensive to the general population or representative of all traumas. Nonetheless, in recent years, with the cooperation of world mental health organizations, researchers have been able to access records and information applicable to a more diverse population of people diagnosed with PTSD. In so doing, the results and conclusions are more all encompassing and better support the relationship between health status and PTSD thereby better directing treatment.

Diseases Explained by the GAS Model

The theory of general adaptation syndrome (GAS) purports that prolonged physiological stress depletes an organism’s energy and overworks the biological system. This results in chronic illness. Using longitudinal study designs, researchers have made causal inferences utilizing the GAS model. In the following articles, direct biological changes were measured quantitatively through blood pressure, heart rate, and cortisol levels.
Beckham et al. (2000) have designed studies that specifically explore the relationship of PTSD to cardiac illnesses. They hypothesized that Vietnam veterans with PTSD, when compared to Vietnam veterans without PTSD, would show signs of high physiological activity. This was evidenced by heart rate and abnormal psychophysiological activity (e.g. lower heart rate and higher blood pressure variability). Sixty-one male veterans diagnosed with PTSD and 56 male veterans without PTSD participated in the study. Patients were fitted with ambulatory monitoring devices that measured heart rate (HR) and blood pressure (BP) every 30 minutes. Patients were also asked to complete a diary of activity level, food intake (specifically caffeine), and particular stressors each time the recorder operated. The diary was used to discern patient levels of anxiety, hostility, anger, and depression. Analysis of variance levels were made on each of the eight dependent variables (age and race; caffeine use and current smoking; past substance abuse or dependence and history of depression; current major depression and current anxiety disorder; anticholinergic medications; beta blockers; alpha-adrenergic blockers; and antihypertensive) when comparing groups. Results of t-tests for the study were as follows: Vietnam combat veterans with PTSD compared to veterans without PTSD demonstrated significantly higher variability in their systolic blood pressure (-2.32), and diastolic blood pressure (-2.11), and repeatedly had an elevated percentage of HR readings above baseline during daily activity (-0.03). The results supported the hypotheses - cardiac variability is significantly associated with PTSD. Most notably, individuals with PTSD showed an increase in heart rate and hypertension (HTN). These findings support the relationship between PTSD and heart disease as the path to cardiovascular problems. It must be noted that this study consisted of a small patient population and specific population of veterans making results not easily generalized across populations.
Convinced that a strong relationship exists between PTSD, cardiovascular illness, and poor health, Beckham et al. (2003) utilized this data and commenced another research study to further explore the PTSD/Cardiac relationship. In the previous study in 2000, Beckham et al. determined that veterans diagnosed with PTSD expressed increased HR and BP variability over those without a diagnosis of PTSD, however, they did not draw a conclusion using health outcome differences between the populations. In the original study (Beckham et al., 2000), participants completed a self-report survey measuring their perceptions of their physical health. In the 2003 study, Beckham, et. al. hypothesized that heightened cardiovascular activity is associated with poorer health and may mediate the relationship between PTSD and physical health outcomes. Veterans with PTSD reported more cardiac and physiological problems. This was also confirmed by higher resting HR as detected by ambulatory monitoring devices. Using multiple regression analysis, PTSD was associated with systolic blood pressure (SBP) variability (.24), physical complaints (.53), and the number of health illness condition outcomes (.33).

Beckham et al. (2000; 2003) results support the GAS model in that after several years of prolonged stress, Vietnam veterans with PTSD experienced more severe cardiac problems than the comparison group. These results were supported by biological changes and physiological measurements, such as increased heart rate and BP.

Glover, Stuber, and Poland (2006) hypothesized that allostatic load (AL) would be highest in mothers diagnosed with PTSD. Allostatic load is similar to GAS in that it explains the attempts by the body to re-establish and maintain balance. In this study, composite or total AL was measured by ten indicators: body mass index (BMI); resting SBP and DBP; serum dehydroepiandrosterone sulfate (DHEA-S); serum high-density lipoprotein cholesterol (HDL); total cholesterol; glycosylated hemoglobin; and urinary cortisol, epinephrine, and norepinephrine
PTSD was assessed using the Posttraumatic Stress Diagnostic Scale (PDS). Fifty-seven young mothers of children diagnosed with cancer participated in the study and were placed into two groups - mothers with and without PTSD. A third group was comprised of mothers without a child with a chronic illness and no diagnosis of PTSD. ANCOVA was utilized to compare the raw values of each AL indicator across groups. Composite or total AL scores were calculated by adding the number of indicators in the top quartile of risk for the total sample. Total AL scores were given a cut-off of three and above to establish them as high risk.

Seven out of 10 subjects with PTSD were classified as high risk. In the group with PTSD, 3 out of 10 were classified as high risk and none in the control group were high risk. Total AL (measured by all variables combined) correlated significantly with the number of PTSD symptoms and symptom severity ($r=0.47$). Unique to this study is the use of BMI as an indicator of AL. BMI is related to weight and obesity, which are risk factors for many illnesses. Glover, et al. (2006) found that AL, as measured by BMI, was the only indicator that was statistically significant. Out of 10 participants with PTSD symptoms, four had a BMI greater than 28.4 while those with no PTSD symptoms had 3 out of 10 participants in the high risk quartile. The eight control subjects had no individuals in the high risk quartile. Results support the hypothesis that AL, as a measure of physiological illness, is related to the symptoms and diagnosis of PTSD.

Immune dysfunction has also been shown to be linked to psychological distress and PTSD. Altemus, Cloitre, and Dhabhar (2003) hypothesized that individuals with chronic PTSD would show increased allergic response to the skin test. Sixteen women with PTSD and 15 women without PTSD were tested for skin allergies. Hypothalamic Pituitary Adrenal (HPA) Axis activity and cortisol levels were measured by obtaining an initial plasma cortisol level
followed by salivary collection of cortisol six times before conducting skin tests, to determine a baseline. After the potential allergen was introduced, plasma levels were collected. Subsequent thereto, participants underwent a skin test to determine their level of responding to external allergens using the same cortisol collection method. The study results supported the hypothesis. Participants with a diagnosis of PTSD showed significantly increased reactivity to allergens compared to the no-PTSD group. The PTSD group had enhanced delayed-type hyper-sensitivity reactions to the skin test. The results also demonstrated that cortisol levels in the individuals diagnosed with PTSD were lower than the no PTSD group - the former had mean plasma cortisol level of 217 nmol/liter and the latter had a mean of 293 nmol/liter. Subjects with PTSD had statistically significant higher mean delayed-type hypersensitivity reactions and significant cortisol levels. This is consistent with previous findings by Heim, Ehler, and Hellhammer, (2000). Altemus et al. (2003) were able to see that low basal levels of cortisol increase vulnerability to enhanced immune activation in individuals with PTSD, that chronic elevated level of cortisol suppress the immune system, and that lower basal HPA axis activity has been related to chronic inflammatory disorders. Measuring the physiological outcome by obtaining cortisol levels strengthens the GAS model as well as reliability of results. This strongly supports the existence of a relationship between PTSD and immunological dysfunction. Notwithstanding, the low number of participants in this study and the gender is important to consider when comparing results to all individuals diagnosed with PTSD. Replication of this study with a larger sample size, that includes both men and women from various backgrounds, would increase reliability and validity of the results. The utilization of self-report questionnaires as well as a diagnostic interview to measure PTSD makes it less probable that subjects were misdiagnosed.
In a unique study by Vasterling et al. (2008), researchers designed a longitudinal study to examine the cause-and-effect relationship between PTSD and physiological health status. A total of 1,542 soldiers were initially considered for participation before deployment. After removing those not being deployed and gauging a willingness to participate in research post-deployment, 800 Iraqi war soldiers were included in the statistical analysis of the research. Soldiers completed the PTSD Checklist (to determine PTSD diagnosis and symptom severity) and the physical component summary (to measure somatic problems). Participants also reported on the health-risk behaviors of smoking and alcohol use. Soldiers completed assessments pre-deployment to and post-deployment from Iraq. The hypothesis was that PTSD symptom severity would be inversely related to post-deployment physical health functioning and that physical health functioning post-deployment would be influenced by health risk behaviors. Researchers conducted regression analysis for the following variables: pre- and post-deployment PTSD; pre- and post-deployment smoking and alcohol use; post-deployment health symptoms; and pre- and post-deployment physical health functioning.

The study results by Vasterling et al. (2008) supported the first part of hypothesis that post-deployment PTSD was inversely related to physical health status. Post-deployment health symptoms were significantly correlated with post-deployment PTSD symptom severity (.65). Pre-and post-deployment PTSD were significantly related to pre- and post-deployment physical health functioning, .16 and .26 respectively. However, data did not support the second part of the hypothesis – PTSD severity and health status did not seem to mediate health risk behaviors. Pre- and post-deployment PTSD severity was not significantly related to pre- and post-deployment alcohol use or smoking.
The study by Vesterling et al. (2008) assumes that the process involved in the PTSD - physiological illness relationship was the GAS model. The longitudinal design allows for the examination of the development of an illness following trauma. This makes the longitudinal design superior to the retrospective design and the cross-sectional design. By utilizing a longitudinal study design, researchers were able to show that PTSD is directly related to poor health functioning because they had a health profile on the subjects before the trauma exposure. The GAS model assumes a cause-and-effect relationship between trauma (the precursor to PTSD) and illness development. This study supports this theory and helps to explain the process by which illness develops in relation to PTSD. Unfortunately, the study has two design flaws. First, researchers did not use measures of biological change, instead relying on subject reporting. Reliance on self-reported measurements as opposed to biological ones reduces the dependability and validity of the results. Second, they did not obtain pre-deployment health symptoms. This would have helped support the cause-and-effect relationship. However, the unique design allows a glimpse into the possibility of the magnitude of the impact that PTSD has on illness development for this distinct military population.

PTSD/Physiological Illness Relationship Supporting the Attentional Mechanism Model

The attentional mechanism model explains the process involved in the PTSD and physiological illness relationship. The model will be used to support the relationship in the various studies through health care utilization, illness reporting, and patient perception. Perception is influenced by personality. Research attending to this construct will be directly using the attentional mechanism model to identify the process involved.

In 2005, Gillcock, Zayfert, Hegel, and Ferguson utilized the attentional mechanism model to support the relationship between PTSD and physiological illness by examining the
frequency of visits to medical clinics. They hypothesized that individuals suffering from either full and partial-PTSD would have: a) higher health care costs; b) more severe symptoms; and c) poorer health functioning. The group reviewed medical records and cross-referenced them to self-reported health statuses of 232 male and female participants. They separated participants into three groups: 1) those without PTSD; 2) those meeting partial criteria for a diagnosis of PTSD; and 3) those meeting full criteria for a diagnosis of PTSD. All participants completed the PTSD Checklist-Civilian Version and the Life Events Checklist to determine the severity of the diagnosis of PTSD. Additionally, other psychometric surveys and checklists were used to determine physical symptoms and healthcare utilization, including the Wahler Physical Symptom Inventory

The hypotheses of the study by Gillcock et al. (2005) were confirmed. Nine percent 9% of all participants met criteria for full PTSD and 25% met criteria for partial PTSD. Analysis of Variance (ANOVA) revealed a significant group difference in clinical visits. According to the attentional mechanism model individuals with PTSD will report physiological illnesses in an attempt to avoid their trauma, mislabel, or in an effort to elicit attention. Gillcock et al. (2005) measured this through medical visits and illness reporting rates. Post-hoc analysis showed that individuals with full PTSD had significantly more office visits, followed by partial PTSD, which in turn, had more visits than the no PTSD group. Participants with full-PTSD averaged 3.37 visits to a medical clinic in a 3-month period and partial-PTSD participants averaged 2.54 visits in the same time period, whereas the no-PTSD group averaged 1.93 visits in a three month period. Results of discriminate function analysis indicated that of all physiological symptom reports, bodily pain and Whaler Physical Symptom Inventory scores were most significantly associated with full-PTSD and partial-PTSD groups when compared to the no-PTSD group.
Gillcock et al. (2005) utilized self-report questionnaires. A self-report questionnaire alone is not as valid an indicator of the diagnosis of PTSD. Rather a self-report questionnaire should be combined with a face-to-face interview. Although researchers used self-report measures and did not control for co-morbid disorders or other health risks, their results were accurate in defining the relationship between PTSD and health status. This particular study did not focus on a single particular illness associated with PTSD, but did collect data correlating several physiological illnesses co-occurring with PTSD in a primary care setting.

While Gillcock et al. (2005) utilized health care utilization as measure of the attentional mechanism model’s role in the support of the relationship between PTSD and physiological illness, Ouimette et al. (2004) used the frequency of illnesses reported to support the relationship. They hypothesized “that PTSD diagnosis and symptoms would be associated with presence of medical conditions and poorer physical health-related quality of life” (Ouimette et al., 2004, p. 2). In order to examine their hypothesis, they utilized the Veterans’ Affairs database, conducted clinical interviews and used participant self-administered questionnaires to 134 veterans. Researchers used hierarchical linear regression analyses to examine the relationship of PTSD with medical conditions. The group with PTSD reported an occurrence of circulatory disorders at a rate of 58% and musculoskeletal disorders at a rate of 73%; compared to the group without PTSD that had prevalence rates of 41% for the former and 46% for the latter disease category. A significant relationship was shown to exist between the occurrence of circulatory disease and those diagnosed with PTSD compared to those not diagnosed with PTSD. In terms of musculoskeletal diseases, the strength of the relationship with the diagnosis of PTSD compared to no-PTSD is even stronger than for circulatory disorders. Although no causal relationship can be determined, t-tests showed a significant general health group difference. PTSD was found to
be significantly related to not only physiological illness but also physical functioning. The small number of participants studied and the broad use of disease and disorder categories compromised the power of the statistical tests of this study. In addition, this study had no longitudinal data. Therefore, no causal inference can be drawn.

Dobie et al. (2004) screened 1,935 American female veterans using the Veterans’ Affairs (VA) database. The study was designed to evaluate if women who screened positive for PTSD had a greater number of self-reported medical problems and a significantly lower quality of life than those without PTSD - even after controlling for co-morbidity of other psychiatric illnesses. The women were mailed surveys inquiring about their health status and health habits. Groups were divided into those having PTSD and those without PTSD. Demographic characteristics of all groups were compared using chi-square analysis and t-tests. The relationship between PTSD and health was determined using logistical regression analysis.

The authors reported that “the data are consistent with our apriori hypothesis that screening positive for PTSD is associated with a range of self-reported health problems and functional impairments among female VA patients” (Dobie et al., 2004, p. 397). Among the highest percentage of reported illnesses were premenstrual syndrome (48.8%), obesity (47%), irritable bowel syndrome (37%), and chronic pelvic pain (33.5%). The rates of these illnesses in the PTSD group were significantly higher than the rates of the same illnesses in the non-PTSD group. The percentages for the non-PTSD control group was as follows: premenstrual syndrome (24.6%), obesity (35.3%), irritable bowel syndrome (17.9%), and chronic pelvic pain (14.4%). Obesity is of particular concern because of the negative impact of obesity on overall health (http://www.cdc.gov/nccdphp/publications/aag/dnpa.htm).
Dobie et al. (2004) relied on patient reporting from questionnaires only. This study did not rely on medical diagnoses by physicians. An absence of physician confirmed diagnoses may have resulted in a greater number of false positives for many physiological illnesses. The Dobie et al. (2004) study also included traumas not meeting the DSM-IV TR criterion A - a definition of trauma. Therefore, the study may have included false positives in diagnosis of PTSD, decreasing the validity and reliability of the results. The attentional mechanism model as discussed earlier in this Review, presupposes that patient reporting can explain and defend the relationship between PTSD and health. While interpretation of the results should be made with caution, the results themselves strengthen the argument of the attentional mechanism model because the results reported in the study rely on patient perceptions of their health.

A study by Frayne et al. (2004) also recognized the PTSD and illness relationship and used the attentional mechanism model to identify the process. Their design attempted to demonstrate that individuals diagnosed with PTSD would report higher numbers of illnesses when compared to individuals with depression and without PTSD or depression. The study utilized a large sample of 30,865 female veterans. The women were divided into three groups: 1) those with PTSD, 2) those with depression, and 3) those with neither PTSD nor depression. A diagnosis of PTSD and depression was made if a subject responded positively to the question “has a doctor ever told [the participant] that [they] had PTSD?” and “has a doctor ever told [them] that [they] had depression?” A physical component scale (PCS) score - a weighted summary of physical health status - was used as an indication of health status. Multivariate regression analysis to predict PCS score was conducted to determine the strength of the PTSD/physiological health relationship.
Frayne et al. (2004) found that “nearly 90 [percent] of women diagnosed with PTSD indicated one serious medical condition. Arthritis, chronic low back pain, obesity, hypertension and chronic lung disease were the most common conditions in the PTSD group” (p. 1,308). While statistical significance was not determined, results indicated that women diagnosed with PTSD had more medical conditions (no averages given) and worse physical health status than women with depression alone or neither diagnosis. The PCS score for patients with PTSD was 38 points lower than for patients with neither diagnosis. Fifty-nine percent of PTSD patients reported chronic low back pain and 32% of the PTSD patients reported chronic lung disease, while subjects with depression endorsed symptoms of the former at 49.5% and the latter at 26.4%. For the group without a diagnosis the rates were 33.4% and 17.5% respectively. Relying solely on self-report surveys may have omitted some participants with undetected PTSD or depression and included some not meeting full DSM-IV-TR criteria for PTSD. However, the sample size of this study was moderately extensive, which increases the ability to generalize the results across populations.

Ciechanowski et al. (2004) administered a 22-page survey to 1,225 female health maintenance organization (HMO) enrollees. They proposed that participants with a diagnosis of PTSD would report more physical symptoms. Three groups of patients participated in the study: 1) no-PTSD, 2) moderate-PTSD, and 3) severe-PTSD. The posttraumatic stress disorder checklist for civilians was used to determine the severity of PTSD. Scores less than 30 indicated no PTSD, scores between 30-44 indicated moderate PTSD, and participants scoring higher than 45 were classified as having severe PTSD. HMO patients participating in the study were seeking services and were diagnosed with a physiological illness, or were seeking aid for symptoms associated with an illness.
Chi-squared analyses were used to compare demographic characteristics of the groups. In the event of significant group differences in the demographic variables of functional disability measures, childhood trauma questionnaire scales, and health risk behaviors, an analysis of covariance (ANCOVA) was used to test for group differences. Results showed “those with moderate or severe [PTSD] symptoms scores had significantly higher numbers of physical and emotional health problems [than the non-PTSD group]” (Ciechanowski et al., 2004, p. 266). Fatigue was observed at a significantly (3.9 odds ratio for moderate PTSD and 9.2 odds ratio for the sever PTSD group) higher rate in both the moderate and severe PTSD groups. The former observed fatigue at a rate of 40% and the latter at a rate of 63%, compared to 15% for the non-PTSD group. While Ciechanowski et al. (2004) did not hypothesize why participants would report more illnesses, it can be inferred that the attentional mechanism model explained the increased reporting either through avoidance, mislabeling, or attention seeking.

However, researchers encountered some problems with the study design. Unfortunately, not all of the participants mailed back the survey and no clinical interviews were conducted. By not conducting clinical interviews and only using self-report questionnaires, the researchers may have included participants with a false positive or false negative diagnosis of PTSD. Notwithstanding, the results are relevant because the questionnaires measured distress as a result of trauma. The study captured many individuals with PTSD and identified the relationship with physical health problems. Even with the problems associated with the study, the results remain consistent with previous research.

Two years after the Ciechanowski et al. study, Seng, Clark, McCarthy, and Ronis (2006) sampled a Medicaid healthcare group. Seng et al. (2006) used archival data on 2,133 women with PTSD and 14,948 randomly selected women without PTSD. Researchers coded the women
according to their PTSD diagnosis, using the DSM-IV TR, their Internal Classification of Disease, 9th edition code(s), the medical procedures they underwent, and their drug prescriptions. The researchers’ goal was to explore the relationship between PTSD and physiological illness. The research population was divided into two groups - those with PTSD and those without PTSD. The two groups were further segmented, based on age, into two subgroups - those who were reproductive age (18-54) and those who were post-menopausal (55+). Seng et al. (2006) focused on three types of health outcomes: 1) categories of disease; 2) five chronic conditions (digestive, genitourinary, musculoskeletal and connective tissue, symptoms of ill-defined conditions, and chronic pelvic pain); and 3) reproductive problems. A series of t-tests and multivariate logistical regression models were utilized to determine the relationship of PTSD to health problems.

Controlling for demographic variables and co-occurring diagnoses, Seng et al. (2006) found significant odds ratio (OR) using t-tests between the post-menopausal PTSD group and the five chronic physiological illnesses: digestive (OR=3.7), genitourinary (OR=2.6), musculoskeletal and connective tissue (OR=5.6), symptoms of ill-defined conditions (OR=3.4), and chronic pelvic pain (OR=6.1) “The PTSD group[s] [in general] had twice the rate of having one chronic condition diagnosis, four times the rate of having two illnesses, and 7 and 11 times the rate of having 3 or 4 such diagnoses,” when compared to the group without PTSD (Seng et al., 2006, p. 50). Such vast difference in reporting of physiological illnesses is strongly supportive of the attentional mechanism model. The model maintains that the statistical significance in illness reporting is the result of mislabeling, avoiding, or attention seeking. These results are consistent with the findings of previous studies that PTSD is closely related to physiological illness.
The archival data did not examine health behaviors, the subject’s pre-morbid state, or the severity of PTSD and medical illnesses. By excluding this data, the study itself did not support any of the other particular models discussed earlier in this Review to explain the relationship between PTSD and physiological illness. This study may also have included females in subgroups in which some women over 55 were still able to reproduce and some 18-54 were post-menopausal. The inclusion of women in inappropriate subgroups may have impacted the research with false positives and false negatives, thus decreasing the reliability and validity of the results. In spite if the fact that the study had a large sample size, the findings cannot be directly compared to men as it consists of only women.

In a cross-sectional design, Buchwald et al. (2005) examined the link between PTSD and pain in two American Indian tribes. They attempted to answer the questions: “are current bodily pain and lifetime PTSD associated, and if so, does the magnitude of this relationship vary according to tribe or sex?” (Buchwald et al., 2005, p. 73). “Lifetime PTSD” was defined as meeting full criteria for a diagnosis of PTSD during the lifetime of a participant. Buchwald et al. (2005) utilized a self-report pain survey and conducted interviews using the Composite International Diagnostic Interview to determine a diagnosis of PTSD. Linear regression was used to determine the association between lifetime PTSD and body pain. Results showed that individuals with PTSD reported significantly greater pain levels compared to those without PTSD. Individuals with PTSD scored 9 points lower on the pain subscale than individuals without PTSD after adjusting for the total number of endorsed painful conditions. Pain is often overlooked in a client population when no precipitant is evident. However, results of this study indicated that pain is related to PTSD. Awareness of this relationship may impact conceptualization of PTSD, treatment, and outcome. Although the results are limited to this
population and should be applied with care when discussing the majority population, the large sample size of 3,084 makes the results particularly interesting and supportive of the PTSD and pain relationship. Results may be attributable to the sources of the attentional mechanism model. Individuals with PTSD may be suffering from pain as a result of trauma exposure, reporting pain to avoid thoughts of trauma, mislabeling their pain, or seeking attention.

The main tenant of the attentional mechanism model is based on individual perception. How individuals perceive their trauma may affect the development PTSD and health outcomes, and may be mediated by personality traits and disorders. Chung, Berger, Jones, and Rudd (2006) attempted to explore the relationship between Myocardial Infarction (MI) patients and post-MI patients with and without PTSD and their general health. The control group consisted of subjects with no history of MI and no diagnosis of PTSD. Researchers also attempted to identify the personality traits contributing to health problems in post-MI patients with PTSD.

Ninety-six post-MI males and females between the ages of 60 and 91 participated in the study. Each participant completed the Posttraumatic Stress Diagnostic Scale, the General Health Questionnaire, and the Neuroticism, Extroversion, Optimism-Five Factor Inventory, (examining personality traits). T-tests were used to compare demographic characteristics in three groups: those with MI and no PTSD; those with MI and PTSD; and those without MI or PTSD. Regression analysis indicated that neuroticism was significantly related to poor general health in the MI patients with PTSD. According to Chung et al. (2006), personality plays an important role in the way in which individuals perceive stress and comply with treatment plans and medical advice. This suggests one path by which PTSD affects health. This particular study has a unique patient population that makes results less valid and reliable. Additionally, caution should be used when trying to generalize the results to a broader population.
Relationship Between PTSD and Physiological Illness Supporting the Health Belief Model and the Attentional Mechanism Model

Neria and Koenen (2003) designed a study utilizing veterans with combat trauma as participants. They attempted to show that combat stress reaction (CSR) - another term for PTSD for war veterans in Middle East – could accurately predict physical health outcomes and adverse health practices. In support of the attentional mechanism model, researchers attempted to show that participants with CSR would report more physiological illnesses. In support of the health belief model, the design tried to demonstrate that CSR participants would engage in poorer health practices than participants without CSR. The sample included 184 control veterans without CSR and 112 Israeli war veterans with CSR. Participants completed questionnaires to assess health status, disability, demographics, and CSR symptoms. T-tests and Pearson correlations were used to analyze the data to compare groups and to determine the relationship between the independent and dependent variables. Comparisons of physiological illnesses between groups were significant. Results indicated that 37% of CSR participants reported headaches and 15.6% reported increased pulse rates, compared to 24.7% and 6% respectively in the group without CSR. The analysis also attempted to calculate the number of PTSD symptoms experienced by CSR subjects. Hierarchical linear regression analysis showed that PTSD symptoms were statistically significant in predicting the number of physical symptoms (other variables included marital status, level of combat exposure, and physical impairment). The presence of PTSD was most significantly correlated with physical symptoms (.47) when compared to the previously mentioned variables. The increased reporting of symptoms and more frequent reporting of headaches and increased pulse can be attributable to the attentional mechanism model. Also noteworthy was that 39.4% of CSR participants were smokers.
compared to 26.4% of the group without CSR; therefore, the frequency between the health behavior of smoking and a diagnosis of CSR was significant. The significance of smoking is consistent with the health belief model. Participants with CSR were more likely to engage in this high risk behavior than individuals without CSR and therefore increase their vulnerability to disease development. It is important to mention that these results are with a specific cultural population and while the sample size is moderate, results should be generalized conservatively across cultures.

Lauterbach, Vora, and Rakow (2005) utilized data from The National Comorbidity Study (NCS) for an analysis of the relationship between PTSD and physiological health and wellness. The NCS yielded information on the relationship between PTSD and health between 1990 to 1992 and 2001 to 2002. In the study, 8,098 participants underwent a diagnostic interview using the Diagnostic Interview Schedule. From the original sample, 5,877 participated in a health risk factor interview and 2,221 original participants did not respond at all. Randomly selected participants from the original non-responders were given financial incentives to complete the health risk factor interview in order to determine whether there were increased psychiatric illnesses in the original non-responder population. No new participants were added. The 8,098 original respondents gave information about medical history, health perceptions, and health-related behaviors during the diagnostic interview. Chi-square analysis was used to compare the frequency of PTSD, health status, and health care utilization between groups. The data was then made available to researchers in various fields and with various hypotheses.

The NCS data base confirmed the hypothesis of Lauterbach et al. (2005), that individuals with PTSD have 1) a significantly elevated incidence of medical illnesses (particularly stress related disorders), 2) perceive their health to be worse than the subjects without PTSD, 3) report
greater levels of ambient stress, 4) engage in fewer positive health-related behaviors (i.e. eating three balanced meals per day, exercising two times a week, and sleeping seven hours a night), and 5) have less comprehensive healthcare coverage than persons without PTSD. The results identified three separate illnesses commonly associated with PTSD: 1) arthritis (17.7%); 2) hypertension (“HTN”) (14.2%); and 3) asthma (10%). Additionally, the results supported the hypothesis that individuals with PTSD, when compared to participants without PTSD, reported significantly poor overall health, infrequently engaged in positive health-promoting behaviors, such as eating well and exercising, and reported higher levels of home and work related stress. The health belief model proposes that individuals with PTSD engage in higher risk behaviors and believe they have little ability to impact their overall health. This study supports the theory that individuals with PTSD are less inclined to engage in practices that positively influence their health. Less directly supported by the research is the attentional mechanism model. Individuals’ perception of health may have played a role in the reporting of poorer overall health than individuals without PTSD.

The Lauterbach et al. (2005) study design used a structured diagnostic interview for the diagnosis of PTSD, thus decreasing the risk of having a false positive or false negative diagnosis. Researchers referred to the subjects with PTSD as having a lifetime history of PTSD. Unfortunately, they did not identify what constituted a lifetime history. Additionally, there was no delineation in the type of trauma which occurred, the gender make-up of the subjects, or the time that had elapsed since the trauma occurred. Therefore, the results should not be generalized to all PTSD populations.
Integration and Summary

PTSD is clearly related to various physiological illnesses. Researchers, who have conducted numerous studies, have shown that there is a strong relationship between PTSD and cardiovascular illness (Beckham et al., 2000; Beckham et al., 2005), immunological disease (Altemus, Cloitre, & Dhabhar, 2003) and pain (Buchwald et al., 2005). Studies have also shown that PTSD is highly associated with poor health habits such as smoking, alcohol abuse, lack of physical activity, and one’s failure to comply with medical treatment directives. (Lauterbach, Vora, & Rakow, 2005 and Neria & Koenen, 2003)

Little research has been conducted that explores the specific traumas that can lead to PTSD, or how these traumas individually may impact the PTSD/physiological illness relationship. Although cause and effect has not been determined through the research, the models help explain the process involved in the relationship through behaviors, personality, perception, education, and biological and hormonal changes.

PTSD is sometimes diagnosed with other axis I and II disorders. Research has proven that the diagnosis of PTSD is more highly associated with physiological illnesses than depression (Frayne et al., 2004). Research by Chung et al. (2006) showed that the personality trait of neuroticism when accompanied with PTSD shares a strong relationship with physiological illnesses. However, other axis II personality disorders did not appear to show a strong relationship with PTSD and physiological illness. All of these studies have supported the relationship between physiological illness and PTSD. However, research has not lead to any conclusions regarding the effects of the number of traumas on physiological health, the length of time since a trauma occurred, or the duration of the trauma and its impact on physiological health. Such results and support indicate that clinicians - psychological and medical - must be
able to recognize PTSD from the medical symptoms associated with it, as well as its mental health symptoms.

While supportive of the PTSD/physiological illness relationship, this research, although extensive and thorough in many respects, has some shortcomings. These shortcomings include: no causal inferences can be drawn, only one longitudinal study has been conducted, much of the research uses many self-report questionnaires and measures without a structured or professional interview for diagnosing, and some studies lack matched comparison groups without PTSD. Without a longitudinal design, no determination can be made as to cause and effect.

Finally, problematic to many studies is the use of self-report questionnaires to make a diagnosis of PTSD without utilizing a clinical interview in addition. Self-report questionnaires, many times, inaccurately assess severity and intensity of symptoms, possibly resulting in the inclusion of false positives and the exclusion of false negatives. Accordingly, the data may not be as reliable or valid as it would have been if a clearer diagnosis of PTSD was made.

These methodological shortcomings make it difficult to evaluate the contributions of the various models of PTSD and health. Without any causal inferences to draw and lack of a comparison group (i.e. group without PTSD), support of the general adaptation syndrome (GAS) is more difficult.

Moreover, as stated earlier in the review, the GAS model suggests that trauma exposure is the precipitant to the prolonged physiological stress response, which in turn causes adverse health outcomes. Longitudinal studies with information on pre-morbid functioning matched with individuals without PTSD would be able to show that health problems were the result of trauma after prolonged exposure. More longitudinal studies of this design would also be useful in exploring the relationship between PTSD and physiological illnesses as they relate to the time
since the trauma occurred and how the number of traumas may influence physiological symptoms.

The attentional mechanism model and the Health Belief Model are supported by the research. Simply put, PTSD from physical or combat trauma exposure can result in injury. This supports the first source of the attentional mechanism model. According to the studies cited above, PTSD participants tend to report more physical symptoms than individuals without a trauma history. However, only the study by Chung et al. (2006) explored the association of self-reporting with personality. This research found that neuroticism is more highly related to PTSD and the reporting of more physiological illnesses. This finding is indicative of the attentional mechanism model at work. Research cited supports the HBM that patients with PTSD infrequently engage in positive health practices (Lauterbach et al., 2005) and are less compliant with treatment recommendations and engage in riskier behaviors (Lauterbach et al., 2005 & Neria and Koenen, 2005).

In some studies, researchers included subjects with symptoms of PTSD and did not require full diagnosis of PTSD in order to examine the PTSD/physiological illness relationship (Sachs-Ericsson et al., 2005). Studies that included symptoms of PTSD without a diagnosis of PTSD may not be completely applicable to individuals who have full PTSD. This inclusion of symptoms without the full diagnosis may have therefore made results less reliable and valid for those diagnosed with PTSD.

Future Research

Most of the current research has not been able to draw causal conclusions. Therefore, more longitudinal studies will need to be employed to examine causality of physiological symptoms prior to diagnosis of PTSD and post diagnosis. Designing longitudinal studies may
assist in better supporting the GAS and the attentional mechanism model. The GAS purports that prolonged physical stress results in an increase in physiological disease. The design of the longitudinal studies to examine GAS should therefore obtain cortisol levels periodically to examine the effects of physical exhaustion from prolonged stress. In order to support the attentional mechanism model, longitudinal designs can help to determine who has subsequent physiological illnesses following trauma exposure. Studies that look at the influence of personality on the PTSD/physiological health relationship would be more supportive of the attentional mechanism model, in a longitudinal design. While Chung et al. (2006) explored axis II diagnosis and identified the trait of neuroticism linked to PTSD outcome, the population was limited. Individuals with neurotic traits may endorse physical symptoms more often when diagnosed with PTSD thereby supporting the attentional mechanism model. A longitudinal design with matched groups before and after a trauma may support the HBM in its hypothesis that individuals with a PTSD diagnosis engage in poorer health practices. Longitudinal studies may also be able to better support the attentional mechanism model in predicting who has subsequent health problems following trauma by including a matched comparison group that is followed before and after trauma exposure.

Some of the current research included subjects with symptoms of PTSD and did not solely focus on the diagnosis of PTSD. Stricter adherence to the DSM-IV TR diagnostic criteria should help support the relationship between PTSD and physiological illness. Stricter adherence would lessen the inclusion of false positives and would provide a better focus on PTSD rather than the symptoms of the disorder. Both of these would make the results more reliable. A way to improve reliability in future research is to conduct a structured interview (e.g. the structured
clinical interview for diagnosis [SCID]). Having interviewers trained to use the SCID may result in less false positive and false negative diagnoses.

Many of the studies group different types of traumas together (Buchwald et al., 2005; Cienchanowski et al., 2004; Frayne et al., 2004; Gillcock et al., 2005; Glover et al., 2006; Lauterbach et al., 2005; Ouimette et al., 2004; Seng et al., 2006; and Yarvis et al., 2005). Others utilized a combat veteran population and did not screen for PTSD specifically related to combat trauma, rather, they included all veterans meeting criteria for PTSD regardless of the type of traumas they had survived (Dobie et al., 2004). It would be interesting if future research explored whether different traumas result in different physiological illnesses or whether they increase the severity of illnesses versus other traumas.

None of the studies took into consideration the effect of time since the abuse occurred or the time associated with a diagnosis of PTSD (Buchwald et al., 2005; Cienchanowski et al., 2004; Cromer & Sachs-Ericsson, 2006; Dobie et al., 2004; Frayne et al., 2004; Gillcock et al., 2005; Glover et al., 2006; Lauterbach, et al., 2005; Ouimette et al., 2004; Sachs-Ericsson et al., 2005; Seng et al., 2006; and Yarvis et al., 2005). Time is a factor in the GAS model and relates to prolonged stress. A study that accounts for the amount of time one has been diagnosed with PTSD or the time since the trauma has occurred may be able to help further support GAS.

Finally, much of the research used to make general statements of the relationship between PTSD and physiological health is obtained using small sample sizes, limited demographic populations, and specific traumas (i.e., sexual, physical, and childhood). In my opinion, research with larger sample sizes and more general populations (e.g. non-combat) would make the findings more comparable across more diverse and general populations.
Clinical Implications

The relationship between PTSD and physiological health is well supported. The hypotheses supported in the reviewed studies indicate that PTSD shares a relationship with various medical illnesses across gender and different populations. Identification of the process(es) involved to explain the relationship and understanding and awareness of the various medical illnesses diagnosed in individuals with PTSD is important to the conceptualization, treatment, and potential outcome of PTSD. If PTSD and its relationship with various medical conditions are better understood, then diagnoses of PTSD may be made earlier and treatment may be more comprehensive. Awareness of the relationship would encourage primary care physicians to refer their patients more readily for psychological evaluation and treatment. Furthermore, it would influence mental health clinicians to refer their clients for a full medical evaluation with their primary care physicians. The relationship established between the two professions would allow for a more comprehensive treatment in a multidisciplinary fashion.

A medical professional treating a physiological illness may screen for trauma exposure utilizing short self-report surveys that can be scored in office and interpreted based on standardized scores, such as the Impact of Trauma Exposure questionnaire. Perception, personality, and education are components of the attention mechanism model and can be used in formulating treatment for individuals with PTSD and physiological illnesses. Being attentive to patient report and providing empathetic listening may help patients receive the attention they may be seeking. Medical professionals can also use the information from the Impact of Trauma Exposure questionnaire or other tests to educate the patients about the relationship between PTSD and physiological health. The attention and education may help patients to not avoid the trauma and to not mask or mislabel their physical symptoms.
Mental health professionals will also be impacted by their understanding of the relationship between PTSD and physiological health. The GAS model is supported by increased heart rate, blood pressure, and other measurable physiological processes. Mental health professionals can be trained to take these measures to obtain baseline levels and then repeat tests after discussing mental health issues to determine if an elevation occurs. These measurements can then be utilized in various treatments such as biofeedback and relaxation. The HBM and the attentional mechanism model are impacted by cognitions and perceptions that influence behaviors. Cognitive behavioral therapy examines individuals’ cognitions and core beliefs in an effort to identify the emotions that are present and the behaviors being displayed. If cognitive behavioral therapy is utilized correctly it can change an individual’s thoughts and perceptions of their illness and their perception of their ability to impact their health and wellness. The awareness gained may decrease the incidence of mislabeling their symptoms. The clinician can then use the altered cognitions to treat the feelings and behaviors associated with the trauma and negative cognitions – feelings such as panic, fear, and hopelessness and behaviors such as engaging in poor health risks and attention seeking.

An increased understanding of the relationship between various medical illnesses and PTSD may also help change the way in which PTSD is viewed in the community. Currently, PTSD is viewed as a psychological illness and is treated independently of the associated physiological illnesses. Although a relationship between PTSD and physiological illness has been established, it is not seen as a diagnosis that could be better treated while simultaneously treating the medical illnesses. Therefore, managed care companies often charge higher co-pays for mental health treatment and cover fewer visits for treatment related to PTSD. Because the relationship has been established between PTSD and poor physiological health, it would be
beneficial to conduct future treatment outcome studies to determine the efficacy of treatments that include both a medical and mental health component.

This type of research may result in managed care companies responding to the request for lower co-pays for treatment with a diagnosis of PTSD and/or increasing the number of mental health sessions, especially if significant improvement in the medical condition can be shown. This awareness and understanding of the PTSD/physiological illness relationship as the result of the research discussed above and future research will impact the conceptualization of PTSD. Posttraumatic Stress Disorder need not be understood as a simply a mental disorder, but rather, as a disorder that is the result of a traumatic event related to health symptoms.
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