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Examining PTSD Symptoms and the Effectiveness of Group Therapy Among African American and Caucasian Veterans

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EXAMINING PTSD SYMPTOMS AND THE EFFECTIVENESS OF GROUP THERAPY
AMONG AFRICAN AMERICAN AND CAUCASIAN VETERANS

A dissertation submitted in partial fulfillment of the requirements for the
degree of Doctor of Philosophy at Virginia Commonwealth University

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Abstract

Title: EXAMINING PTSD SYMPTOMS AND THE EFFECTIVENESS OF GROUP
THERAPY AMONG AFRICAN AMERICAN AND CAUCASIAN VETERANS

By: Jennifer Anne Coleman, M.A., M.S.

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Millions of Americans have served in the military, and improved survival rates in wars have

increased the percentage of those who return home. Posttraumatic stress disorder (PTSD) is one

of the most prevalent mental health diagnoses for veterans. Although few studies have examined

the link, previous research as well as the minority stress model and transgenerational trauma

theories, suggest that race may be associated with PTSD, particularly in military samples. The

current study examined whether there were differences in PTSD symptomology (global and

symptom cluster-specific) based on veterans' race and whether group therapy effectively reduced

symptoms of PTSD. Data were collected from male veterans who identified as non-Hispanic

Caucasian or non-Hispanic African American ($N = 450$) and participated in a 10-week, combat-

related, group therapy PTSD Recovery Program between 2010 and 2014. Participants completed

the Posttraumatic Stress Disorder Checklist- Military version (PCL-M) measure at three time

points (intake, pre-treatment, and post-treatment). Global PTSD symptoms and three of the four

symptom clusters did not differ between African American and Caucasian participants at intake.

However, the symptom cluster of re-experiencing was higher for African Americans compared

to Caucasians at intake. Additionally, the Recovery Program led to a reduction in PCL-M scores. This symptom reduction occurred regardless of race, with neither racial group improving more than the other. Moreover, dropout rates for the Recovery Program were on par or better than those for other trauma-focused therapies. Although the overall racial and ethnic composition of groups was not related to most outcomes, the percentage of racial/ethnic minority members in groups was negatively associated with the number of sessions attended for Caucasians. Findings also indicated that the PCL-M demonstrated good psychometric properties in an African American sample. One implication from this study is that the current conceptualization and measurement of PTSD may be insufficient. It may be more helpful to examine specific PTSD symptom clusters, especially when assessing differences by race. The effectiveness of the PTSD Recovery Program supports alternative options to treating veterans with PTSD in the VA system. Last, it is important for therapists to consider the composition of groups when conducting group therapy.

Examining PTSD Symptoms and the Effectiveness of Group Therapy Among African American

and Caucasian Veterans

As a growing proportion of Americans join the military and serve in recent conflicts (e.g.,

Operation Enduring Freedom, Operation Iraqi Freedom, and Operation New Dawn), the number

of returning veterans increases. The terms *military personnel* and *service member* are broad

categories that include individuals who are in active duty service in any of the military branches

(i.e., Army, Navy, Air Force, Marines, Coast Guard, or Reserve Units; Coll, Weiss, & Yarvis,

2011). A *veteran* is an individual who has served in the military but who has been discharged

from the military. According to the National Center for Veterans Analysis and Statistics

(NCVAS, 2016), as of 2014 there were roughly 22.3 million U.S. veterans, almost a quarter of

whom are racial or ethnic minorities.

Veterans often suffer from various physical or mental health problems (e.g., traumatic

brain injuries, depression). Posttraumatic stress disorder (PTSD) is considered a signature or

hallmark injury of the recent wars in Iraq and Afghanistan (Institute of Medicine [IOM], 2012).

PTSD is a mental illness that includes exposure to or learning about a traumatic event, in

addition to experiencing symptoms from four symptom clusters of re-experiencing, avoidance,

arousal, and emotional numbing (American Psychiatric Association, 2013). Many veterans

choose to receive medical care for physical or mental health issues at Veterans Affairs Medical

Centers (VAMC), where they seek services for a variety of reasons. For example, veterans who

served in a combat zone are eligible for services at a VAMC for up to 5 years after the date they

apply for Veterans Administration (VA) healthcare services (IOM, 2012.). Some veterans prefer

to receive all of their services at one facility (e.g., a VAMC) and prefer the veteran-centered

atmosphere of VAMCs. It is estimated that in 2012 alone, the VA spent close to $3 billion on PTSD treatment for both veterans and current service members (IOM, 2014).

Over time, the racial composition of active duty military personnel has shifted from roughly 86% Caucasian in the 1960s to 69% Caucasian in 2014 (DeBruyne, & Leland, 2015; Department of Defense, 2014). It is projected that racial minorities will comprise 34% of the veteran population by 2040 (NCVAS, 2016). Research suggests that racial minority status is a risk factor for PTSD in both veterans and civilians (Brewin, Andrews, & Valentine, 2000). The Institute of Medicine (2012) concluded in a recent report that there is some empirical evidence suggesting that racial minority military personnel have a higher likelihood of receiving a diagnosis of PTSD. However, because other studies have not found a relation between race and PTSD, the data are still too inconsistent across studies for any conclusive statements. Thus, additional research is needed to clarify the intersection of race and PTSD, especially for military personnel.

Traditional treatments for PTSD include medication, assessment, and psychotherapy. Newer treatments also exist, such as eye movement desensitization and reprocessing (EMDR), yoga, or meditation. Group therapy is one modality of treatment that has been provided for many years. Sloan, Bovin, and Schnurr (2012) reviewed published studies on group treatment for individuals with PTSD (military and non-military samples) and concluded that group therapy is an effective method for reducing symptoms of PTSD. However, there is a dearth of research examining differences in therapy outcomes based on the race of the participant in samples with PTSD (Lester, Resick, Young-Xu, & Artz, 2010).

Military personnel seek services for mental health issues from a variety of sources including community providers, Vet Centers (community centers created for veterans), or

VAMCs. At the Hunter Holmes McGuire Veterans Affairs Medical Center in Richmond, Virginia, the first line of treatment for outpatient combat-related PTSD is group therapy. Due to the high volume of returning veterans who need services, the McGuire VAMC provides treatment in a group format before offering veterans individual psychotherapy. Exploring whether group therapy significantly reduces PTSD symptoms for both African American and Caucasian veterans could make a unique contribution to the current literature.

To date, there has been little research exploring mental health disparities in veteran populations, particularly based on veterans' race or ethnicity. A *health disparity* is defined as a difference between groups based on factors such as race, ethnicity, gender, education, income, disability, sexual orientation, or geographic location (U.S. Department of Health and Human Services, 2000). Health disparities affect millions of individuals and have been shown to have serious consequences (e.g., higher rates of mortality). It is important to note that, although the terms *race* and *ethnicity* are often used interchangeably, they have very different meanings. *Race* has been defined as a way of grouping people based on physical characteristics, including skin color, hair type, or facial features (Betancourt & Lopéz, 1993). In contrast, *ethnicity* is more closely related to an individual's culture, in that a group of people may share a common language, religious beliefs, or similar cuisines (Betancourt & Lopéz, 1993). Researchers have found that there are more within-group genetic differences in racial groups than between-group genetic differences across racial groups (Betancourt & Lopéz, 1993). Thus, the concept of race is socially constructed and often considered an arbitrary way to classify people into groups. However, despite these facts, researchers continue to use racial grouping as a way to describe participants. For the purpose of this dissertation, I will use the previously stated terminology and

definitions when describing the proposed study. However, in the literature review, I will use the terminology that the authors of each study used to be consistent with their language.

Both actual and perceived racial discrimination have been found to negatively impact mental and physical health (Pascoe & Richman, 2009; Williams & Mohammed, 2009). *Racism* can be defined as "a system of dominance, power, and privilege based on racial-group designations; rooted in the historical oppression of a group defined or perceived by dominant-group members as inferior, deviant, or undesirable" (Harrell, 2000, p. 43). Racism can be overt (e.g., referring to someone using a racial slur) or covert (e.g., only hiring Caucasians and justifying the decision based on something other than race) and may or may not be intentional or conscious. Racism also exists at different levels, including interpersonal/individual, group, cultural, and sociopolitical levels (Harrell, 2000). The consequences of racism reach beyond the microlevel (i.e., impacting only the individual) to also impact social, educational, and material resources (Brondolo, Gallo, & Myers, 2009). The inequalities of resources (e.g., education, occupation) based on race affect health directly (e.g., access to nutritious food and adequate medical care) and indirectly (e.g., anxiety or stress). For example, racial discrimination affects healthcare seeking behaviors and medical adherence behaviors (Williams & Mohammed, 2009). Because racism is not always overt and obvious, individuals from minority groups may experience *perceived racism,* which is defined as "the subjective experience of prejudice or discrimination" (Clark, Anderson, Clark, & Williams, 1999, p. 808).

A wealth of research supports the notion that health disparities for racial minority groups lead to profound negative consequences. For example, even after controlling for socioeconomic status, Blacks have been found to have higher levels of biological risk factors (e.g., cholesterol, blood glucose, and blood pressure) than Whites (Crimmins, Kim, Alley, Karlamangla, &

Seeman, 2007). In 2005, the average risk of death was approximately 30% higher for Blacks than for Whites, and Blacks had higher rates of death for most of the leading causes of death (i.e., heart disease, cancer, stroke, diabetes, kidney disease, hypertension, and liver cirrhosis; Kung, Hoyert, Xu, & Murphy, 2008). As a group, African Americans (and Native Americans) have worse health compared to any other racial group in the U.S. (Adler & Rehkopf, 2008). Nonetheless, despite reported differences based on health or wealth, many researchers still do not consider the influence of race or ethnicity on psychological outcomes. In a review of nearly 400 National Institute of Mental Health funded clinical trials, less than half of the studies included complete information regarding patient racial and ethnic backgrounds (Mak, Law, Alvidrez, & Pérez-Stable, 2007).

For the proposed study, two theories will be used to conceptualize the rationale for the aims, although neither theory will be directly tested. The minority stress model (Meyer, 1995) posits that individuals who are minorities experience higher levels of stress and worse physical health due to discrimination. Research supports the minority stress model, showing that discrimination leads to negative mental health outcomes, such as increased anxiety or depression (Williams & Mohammed, 2009; Williams, Neighbors, & Jackson, 2003). Additionally, transgenerational trauma theory suggests that African Americans experience heightened stress as a result of their history with enslavement in the U.S. (Graff, 2014). Considering that both the minority stress model and transgenerational trauma theory propose a relation between race and mental health outcomes, both theories provide a rationale for why African American veterans may be at an increased risk for PTSD.

The purpose of the proposed study is to examine in a group of veterans with PTSD whether there are differences in PTSD symptomology based on veterans' race. The first aim is to

examine whether there are racial differences in PTSD symptomology among veterans with PTSD who are referred for group therapy. It is hypothesized that African American male veterans will have significantly worse PTSD symptoms prior to beginning group therapy compared with Caucasian male veterans. The second aim is to examine whether group therapy is an effective treatment for reducing symptoms of PTSD in African American and non-Hispanic Caucasian male veterans with PTSD. It is hypothesized that group therapy will effectively reduce symptoms of PTSD for both African American and Caucasian veterans, and that there will not be a significant difference in effectiveness between groups based on veterans' race.

Literature Review

The following literature review explores whether there are differences in severity of posttraumatic stress disorder (PTSD) between veterans of different races. This chapter will begin with a brief overview of military populations, military culture, and stigma related to mental health treatment for service members. Next, posttraumatic stress disorder (PTSD) will be discussed in detail followed by information about veterans with PTSD and racial minority veterans with PTSD. Additionally, the literature review will discuss different treatments for PTSD, in particular group therapy for military personnel with PTSD. Last, health disparity research will be reviewed as well as the minority stress model and transgenerational trauma theory, which provide a framework for conceptualizing the proposed study.

Military Population

In 2012, the U.S Census Bureau estimated that 21.2 million Americans were veterans. Of these, roughly 12.9% post-September 2001 Gulf War veterans, 17.1% 1990 to 2001 Gulf War veterans, 34.9% Vietnam era veterans, 10.9% Korean War veterans, and 7.5% World War II veterans. Of the millions of veterans, more than 90% are male, and close to 84% are Caucasian.

Since 2001, over 1.64 million U.S. troops have been deployed in Operation Enduring Freedom (OEF), Operation Iraqi Freedom (OIF), and Operation New Dawn (OND; Tanielian & Jaycox, 2008). Medical and military advances in these new conflicts have decreased the number of casualties sustained in war, resulting in a greater number of military personnel coming home with substantial physical and mental health issues who would not have survived previously. The ratio of the wounded to the dead has substantially increased over time from about 2:1 in World War I to a 7:1 ratio in OIF (Leland & Oboroceanu, 2010). Similarly, the ratio of amputations to deaths has decreased from 1:54 in WW1 to about 1:4 in OIF (Leland & Oboroceanu, 2010). The increase in the number of survivors of war leads to an increase of veterans seeking services for both physical and mental health problems.

Combat veterans in particular may face unique stressors while deployed. In a study of over 6,000 OEF and OIF Army soldiers and Marines, up to 90% reported being attacked or ambushed, receiving incoming mortar or artillery fire, being shot at, seeing dead bodies, or seeing human remains (Hoge et al, 2004). Other common experiences included being responsible for the death of an enemy, handling human remains, knowing someone who was seriously injured or killed, and seeing injured women or children. Witnessing or experiencing traumatic events such as these can lead to long-term mental health consequences. For example, being wounded or injured in combat is associated with developing PTSD (Hoge et al., 2004).

Military Culture and Stigma Towards Mental Health Treatment

Researchers posit that military personnel have their own culture. Military culture includes a certain language, laws, beliefs, behaviors, norms, traditions, and values (Coll, Weiss, & Yarvis, 2011; Reger, Etherage, Reger, & Gahm, 2008). Service members often identify themselves by their branch of service and their rank. Level of rank corresponds to different roles and

responsibilities (Reger et al., 2008). Although each branch of the military has its own unique set of values, there are also beliefs that cut across the military. Beliefs and norms may include the toughness, independence, stoicism, machismo, self-reliance and valuing other military members' lives more than one's own (Litz, 2014; Tanielian & Jaycox, 2008). Military culture discourages weakness, as is evident by logos such as "Army Strong" (Danish & Antonides, 2009). When military service members return to civilian life, they often face what is termed a "culture shock," as they have to readjust to civilian life (Coll, Weiss, & Yarvis, 2011).

In part due to military culture, service members face unique barriers to seeking treatment for mental health related concerns. Research with U.S. Army soldiers suggests that stigma is a barrier to mental health treatment (Hoge, 2004; Kim, Britt, Klocko, Riviere, & Adler, 2011; Kim, Thomas, Wilk, Castro, & Hoage, 2010; Vogt, 2011). Stigmas are negative, and often incorrect, attitudes held about a person and may incorporate self-stigma (i.e., internalized prejudice) or public stigma (i.e., public prejudice; Corrigan, 2004; Corrigan & Penn, 1999). In a study assessing barriers to treatment in a sample of U.S. National Guard soldiers, 49.2% endorsed significant barriers (e.g., transportation, scheduling, etc.) to mental health treatment and a third of participants reported experiencing stigma-related barriers (e.g., being seen as weak or blamed for problems) to treatment (Valenstein et al., 2014). Another barrier to mental health care for veterans is concern about the confidentiality surrounding therapy and how seeking mental health treatment might affect their future in the military (Tanielian & Jaycox, 2008). Service members also report fears that their leadership will perceive them negatively or treat them differently if they do receive mental health care (Quartana et al., 2014; Valenstein et al., 2014; Zinzow et al., 2013).

Stigma-related barriers negatively affect service members' intentions and behaviors about

seeking mental health care. Kim and colleagues (2011) surveyed active duty U.S. Army soldiers

deployed to Afghanistan and Iraq to learn more about stigma towards treatment and mental

health care utilization. The researchers found that soldiers with negative attitudes about mental

health treatment were about 40% less likely to seek mental health care. U.S. Army soldiers who

are male have been found to be less likely than female soldiers to use civilian mental health care

(Kim et al., 2011). In particular, male veterans have been found to be less likely to seek therapy

than female veterans (Burnett-Zeigler et al., 2012). Unfortunately, service members with mental

health problems have been found to be more likely to be worried about stigma for seeking mental

health services or are more likely to hold negative attitudes about mental health care (Gould et

al., 2010; Hoge et al., 2004; Pietrzak, Johnson, Goldstein, Malley, & Southwick, 2009; Quartana

et al., 2014; Steenkamp, Boasso, Nash, & Litz, 2014; Warner et al., 2011).

Posttraumatic Stress Disorder

PTSD is a mental illness that results from experiencing or witnessing a traumatic event.

Investigators working on the U.S. National Epidemiologic Survey on Alcohol and Related

Conditions found that the lifetime prevalence of PTSD was around 6.4% (Pietrzak, Goldstein,

Southwick, & Grant, 2011). Other researchers found similar rates for the lifetime prevalence of

PTSD, of around 6.8% (Kessler, Lane, Shahly, & Stang, 2005). Individuals with PTSD often

suffer from other issues or co-morbid diagnoses. For example, PTSD has been associated with

negative outcomes in intimate partner relationships (Lambert, Engh, Hasbun, & Holzer, 2012).

Individuals who are diagnosed with PTSD are at increased risk of developing another mental

illness such as depression, anxiety, or a substance use disorder (Kessler et al., 2005). For

individuals who suffer from PTSD, the symptom clusters of re-experiencing and avoidance have

been found to be significantly associated with an increase in suicide attempts (Selaman, Chartrand, Bolton & Sareen, 2014). Selaman and colleagues (2014) also found that the symptoms of experiencing a physical reaction from reminders, inability to recall aspects of the event, and a sense of foreshortened future are associated with higher suicide attempts.

A number of variables have been found to be associated with PTSD. In Brewin, Andrews, and Valentine's (2000) meta-analysis of risk factors for PTSD in the general population, the factors that correlated highest with PTSD were life stress, a lack of social support, trauma severity, and other adverse childhood events (e.g., negative interactions with parents). Other factors associated with PTSD included family psychiatric history, previous traumas, childhood abuse, psychiatric history, low IQ, low education, low socio-economic status, younger age, and female sex. Factors such as female sex, age at occurrence of trauma, and minority status were risk factors in only a subset of the studies.

Although racial minority status has been found to be a risk factor for PTSD, this important variable has been understudied. In Brewin and colleague's (2000) meta-analysis, only 54% of the studies even reported the race of participants. Individuals' race was examined as a risk factor in only 22 out of the 77 studies. Brewin and colleagues (2000) found that across all studies, PTSD significantly correlated (weighted average $r = .05, p < .001$) with race. However, race was a significantly stronger predictor of PTSD in military samples $(r = .11)$ compared to civilian samples ($r = .04, p < .01$) with PTSD. Additionally, more than twice the number of studies with civilian samples examined race as a variable compared to studies with military samples. Thus, the association between racial minority status and PTSD has been understudied in military populations, despite findings that the two variables have a stronger association in military samples than in civilian samples. Not all studies in the meta-analysis controlled for

combat exposure or other factors that influenced PTSD symptoms, and often when such variables were controlled for, the association between race and PTSD disappeared. The authors concluded that "these results undermine further what very limited evidence there is for race itself being a risk factor" (Brewin et al., 2000, p. 755). A limitation in many of the studies reviewed was that race was often coded as "White" and "Not White," lumping all minority groups into one heterogeneous category. Brewin and colleagues' (2000) meta-analysis illustrates that researchers should continue to examine race as a risk factor for PTSD, especially in military populations.

Although the current research on PTSD is somewhat mixed, findings suggest that racial minority groups are at a greater risk of developing PTSD. Various researchers have examined differences in prevalence and severity of PTSD by race, and there is evidence to suggest that racial minority groups have a higher prevalence of PTSD compared to their White peers (Alcántara, Casement, & Lewis-Fernández, 2013; Himle, Baser, Taylor, Campbell, & Jackson, 2009; Pole, Best, Metzler, & Marmar, 2005). Although data from national samples indicate prevalence rates of PTSD at 6.8% in the general population (Kessler et al., 2005), studies with a majority of African American participants have found rates of PTSD as high as 33% (Alim, Graves, & Mellman, 2006) to 43% (Schwartz, Bradley, & Sexton, 2005). Researchers have found that significantly more African Americans have received a diagnosis of PTSD, compared to non-Latino Whites, even after controlling for sociodemographics, social support, other psychiatric disorders, type of trauma, and frequency of trauma (Alegria et al., 2013). Although African Americans have been found to have higher lifetime prevalence of PTSD compared to non-Latino Whites, African Americans have also been found to be significantly less likely to seek treatment (Roberts, Gilman, Breslau, Breslau, & Koenen, 2011).

Diagnostic Criteria for PTSD

The American Psychiatric Association first introduced PTSD as a diagnosis to the

Diagnostic and Statistical Manual of Mental Disorders (DSM) in 1980. Many years later, and

many iterations later, PTSD has remained a diagnosis in the DSM. The most recent version of

the DSM, the DSM-5, was released in 2013. However, most researchers have not caught up to

the latest changes and thus the majority of the research cited in this literature review is based on

the previous version of the DSM. The DSM-IV-TR, which was released in 2000, categorized

PTSD as an anxiety disorder. The DSM-IV-TR stated that, for PTSD, an individual had to have

been exposed to a traumatic event (Criterion A) in which both of the following happened:

> 1. The person experienced, witnessed, or was confronted with an event or events that
>
> involved actual or threatened death or serious injury, or a threat to the physical integrity
>
> of self or others.
>
> 2. The person's response involved intense fear, helplessness, or horror (American
>
> Psychiatric Association, 2000, p. 467).

In the DSM-IV, PTSD was delineated into three symptom clusters: re-experiencing, avoidance,

and increased arousal. To meet all criteria for PTSD, an individual must have experienced at

least one symptom of re-experiencing, three or more symptoms of avoidance or numbing, and

two or more symptoms of increased arousal. Additionally, all of the symptoms must have lasted

for more than one month (Criterion E) and caused clinically significant impairment (Criterion F)

in either social, occupational, educational, or other important areas of functioning. Each of the

three symptom clusters are outlined below:

Criterion B: Re-experiencing

1. Recurrent and intrusive distressing recollections of the event, including images, thoughts or perceptions.

2. Recurrent distressing dreams of the event.

3. Acting or feeling as if the traumatic event were recurring.

4. Intense psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event.

5. Physiological reactivity on exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event.

Criterion C: Avoidance of associated stimuli or general numbing

1. Efforts to avoid thoughts, feelings or conversations associated with the trauma.

2. Efforts to avoid activities, places, or people that arouse recollections of the trauma.

3. Inability to recall an important aspect of the trauma.

4. Markedly diminished interest or participation in significant activities.

5. Feeling of detachment or estrangement from others.

6. Restricted range of affect.

7. Sense of foreshortened future.

Criterion D: Increased arousal

1. Difficulties falling or staying asleep.

2. Irritability or outbursts of anger.

3. Difficulty concentrating.

4. Hypervigilance.

5. Exaggerated startle response (American Psychiatric Association, 2000, p. 468). Last, the DSM-IV-TR had three specification options: acute (if the symptoms lasted less than 3 months), chronic (lasted for more than 3 months), or delayed onset (symptom onset occurred 6 months after the event; p. 468).

The DSM-5 made substantial changes to many diagnoses, including revisions to how PTSD was defined and categorized. In the new edition of the DSM, PTSD was no longer categorized as an anxiety disorder. Instead, PTSD is now classified under the category of "trauma and stressor-related disorders." Other trauma and stressor-related disorders include: reactive attachment disorder, disinhibited social engagement disorder, acute stress disorder, adjustment disorder, other specified trauma- and stressor-related disorder, and unspecified trauma- and stressor-related disorder. The authors of the DSM-5 removed the qualification that an individual must experience "helplessness or horror" during the traumatic event, and the authors specifically included sexual violence in Criterion A. "Experiencing repeated or extreme exposure to aversive details of the traumatic event(s)" was also added to Criterion A, to include first responders and police officers who often have repeated exposure to traumatic events (American Psychiatric Association, 2013, p. 271).

The authors of the DSM-5 split PTSD into four symptom clusters (instead of three), separating out avoidance and numbing into their own unique categories. The criteria for PTSD according to the DSM-5 include: exposure (Criterion A), intrusive symptoms (Criterion B), avoidance (Criterion C), negative alterations in cognitions or mood (Criterion D), arousal and reactivity (Criterion E), duration (Criterion F), impairment (Criterion G), and the disorder must not be attributed to substance use (Criterion H). Additionally, three new symptoms were included in the diagnostic criteria: blame (Criterion D), persistent negative emotional state

(Criterion D), and reckless or self-destructive behavior (Criterion E). The new criteria for avoidance and numbing are as follows:

Criterion C: Avoidance (includes one or both)

1. Avoidance of or efforts to avoid distressing memories, thoughts, or feelings about or closely associated with the traumatic event(s).

2. Avoidance of or efforts to avoid external reminders (people, places, conversations, activities, objects, situations) that arouse distressing memories, thoughts, or feelings about or closely associated with the traumatic event(s).

Criterion D: Negative alterations in cognitions and mood…beginning or worsening after the traumatic events

1. Inability to remember an important aspect of the traumatic event(s).

2. Persistent and exaggerated negative beliefs or expectations about oneself, others, or the world (e.g., "I am bad," no one can be trusted," "the world is a completely dangerous place.").

3. Persistent, distorted cognitions about the cause or consequences of the traumatic event(s).

4. Persistent negative emotional state (e.g., fear, horror, anger, guilt, or shame).

5. Markedly diminished interest or participation in significant activities.

6. Feelings of detachment or estrangement from others.

7. Persistent inability to experience positive emotions (e.g., inability to experience happiness, satisfaction, or loving feelings; American Psychiatric Association, 2013, p. 271-272).

Scholars have voiced mixed opinions regarding the changes to the diagnostic criteria for PTSD. Miller, Wolf, and Keane (2014) suggested that the recent changes to the definition of PTSD are the biggest changes since it became a recognized disorder. The authors also discussed current controversies around separating PTSD from other anxiety disorders and the creation of the new trauma-specific category. Brewin (2013) stated that PTSD is "the most complex psychiatric disorder in the DSM-5, with 20 separate symptoms organized into four symptom clusters" (p. 557). Using the DSM-IV criteria for PTSD, there were 79,794 heterogeneous symptom profiles compared to a now eightfold increase in the DSM-5 in which there are now 636,120 combinations (Galatzer-Levy & Bryant, 2013). As with any changes in diagnostic criteria, the conceptualization of PTSD is far from perfect.

To date, researchers have found mixed results regarding whether the changes in the diagnostic categories improve the ability to diagnose PTSD. For example, Miller and colleagues (2013) found a lower prevalence of PTSD in both a community sample and a sample of veterans using DSM-5 criteria compared to DSM-IV criteria. Yet Miller and colleagues also stated that the new criteria for PTSD have led to no "substantial or reliable effect on prevalence" (Miller et al., 2014, p. 212). Gentes, Dennis, Kimrel, Rissling, and Beckham (2014) found similar rates of PTSD in a sample of Iraq and Afghanistan era veterans with 38% of the sample meeting the DSM-IV criteria and 37% meeting the DSM-5 criteria. However, the researchers also found that 9% of veterans who would have met criteria for DSM-IV did not meet the criteria for DSM-V. Thus, the changes in the criteria of PTSD may affect the prevalence rates of PTSD even if only minimally.

As clinicians have adjusted how they classify PTSD (from three to four symptom clusters), researchers have also explored how different factor structures best fit the symptoms of

PTSD for measurement purposes. Researchers seem to agree that the new four-factor structure of PTSD has led to improvements in how the illness is conceptualized. Gentes and colleagues (2014) examined how military personnel reported PTSD symptoms according to the Structured Clinical Interview for the DSM (SCID) and found that the four-factor model of the DSM-5 was a better fit using a confirmatory factor analysis compared to the DSM-IV three-factor model. Stein and colleagues (2014) also conducted clinical interviews to gather data on PTSD symptomology and found that a four-factor model best fit the DSM-IV criteria compared to the previously suggested three-factor model. Simms, Watson, and Doebbeling (2002) sampled PTSD symptoms in over 3,000 Gulf War veterans using the PTSD Checklist-Military Version (PCL-M). After testing different models, and using the DSM-IV criteria for PTSD, they found that a four-factor model fit the data best. Similarly, Maestas, Benge, Pastorek, LeMaire, and Darrow (2011) sampled OEF and OIF veterans and found a four-factor model better fit their data compared to a three-factor model.

Some researchers argue that the diagnosis of PTSD is still too narrow and the DSM should include other diagnoses such as developmental trauma disorder (van der Kolk, 2005), posttraumatic personality disorder (Classen, Pain, Field, & Woods, 2006), and complex posttraumatic stress disorder (Herman, 1992). For example, Friedman, Resick, Bryant, and Brewin (2011) argue that many individuals face ongoing threat and conflict, and trauma is not currently assessed as an event that has occurred in the past. Euro-Americans have historically constructed the diagnosis of PTSD in this way, that the precipitating trauma is a single event. Additionally, researchers argue that individuals in the field of psychology must continue working on developing culturally sensitive instruments to assess PTSD (Friedman et al., 2011).

Although clinicians and researchers in the U.S. use the DSM-5 to diagnose mental health disorders, the World Health Organization publishes the International Classification of Diseases (ICD), which is used in other countries to diagnose mental health diseases. The ICD is used in the U.S. as well, but mostly to diagnose physical health issues. Stein and colleagues (2014) point out that the most recent edition, the ICD-10, does not match the criteria set out in the DSM-IV for PTSD. Similarly, the ICD-11, which is proposed to be published in 2017, is also not in line with the criteria in the DSM-5 for PTSD. Thus, there are not only differences in how PTSD has been diagnosed over time in the U.S., but there are also differences internationally which will continue to exist until clinicians and researchers are able to agree on diagnostic criteria.

Measurement of PTSD

There are various measures used to diagnosis PTSD and assess symptom severity. Assessments can be categorized into two main groupings: clinical interviews and self-report measures. A full review of all potential measures of PTSD is not possible in this review; thus, a summary of commonly used measures can be found in Table 1.

Table 1

Overview of Posttraumatic Stress Disorder Measures

Name	Developers	Number of Items	DSM Correspondent
Clinical Interview			
Clinician Administered PTSD Scale for DSM-5 (CAPS-5)	Weathers, Blake, Schnurr, Kaloupek, Marx, & Keane, 2013a	30 items	DSM-5
Diagnostic Interview	N/A	Varies	Varies
Posttraumatic Stress Disorder Symptom Scale-Self Report (PSS-I)	Foa, Riggs, Dancu, & Rothbaum, 1993	Semistructured interview based on 17 items	DSM-IV
Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I)	First, Spitzer, Gibbon, Williams, & Benjamin, 1997	Varies	DSM-IV

(Table continues)

Table 1 (continued)

Overview of Posttraumatic Stress Disorder Measures

Name	Developers	Number of Items	DSM Correspondent
Screens			
Disaster-Related Psychological Screening Test (DRPST)	Chou et al., 2003	17 items	DSM-IV
Primary Care PTSD Screen (PC-PTSD)	Prins et al., 2003	4 items	--
Short Form of the PTSD Checklist-Civilian Version	Lang & Stein, 2005	6 items	--
Short Post-Traumatic Stress Disorder Rating Interview (SPRINT)	Connor & Davidson, 2001	8 items	--
Short Screening Scale for PTSD	Breslau, Peterson, Kessler, & Schultz, 1999	7 items	--
SPAN (derived from the DTS)	Davidson, 2002	4 items	--
Self-Report Measures			
Davidson Trauma Scale (DTS)	Davidson et al., 1997	17 items	DSM-IV
Detailed Assessment of Posttraumatic Stress (DAP)	Briere, 2001	105 items	DSM-IV
Distressing Event Questionnaire (DEQ)	Kubany, Leisen, Kaplan, & Kelly, 2000	35 items	DSM-IV
DSMPTSD-IV (based on IES)	Fullerton et al., 2000	12 items	DSM-IV
Impact of Events Scale- Revised (IES-R)	Weiss, 2004	22 items	No
Life Events Checklist for DSM-5 (LEC-5)	Weathers, Blake, Schnurr, Kaloupek, Marx, & Keane, 2013b	Part 1: 17 items, Part 2: 8 items	No
Los Angeles Symptom Checklist (LASC)	King, King, Leskin, & Foy, 1995	43 items	No
PK scale of MMPI	Keane, Malloy, & Fairbank, 1984; Lyons & Keane, 1992	46 items	No
Mississippi Scale for Combat-Related PTSD (M-PTSD)	Keane, Caddell, & Taylor, 1988	35 items	No
Modified PTSD Symptom Scale (MPSS-SR)	Falsetti, Resnick, Resick, & Kilpatrick, 1993	17 items	DSM-IV
Penn Inventory for PTSD	Hammarberg, 1992	26 items	DSM-IV

(Table continues)

Table 1 (continued)

Overview of Posttraumatic Stress Disorder Measures

Name	Developers	Number of Items	DSM Correspondent
Self-Report Measures (cont'd).			
Posttraumatic Stress Diagnostic Scale (PDS)	Foa, 1995	49 items	DSM-IV
Posttraumatic Stress Disorder Questionnaire (PTSD-Q)	Cross & McCanne, 2001	17 items	DSM-IV
PTSD Checklist (PCL) Civilian, Military, and Specific Trauma versions	Weathers, Litz, Herman, Huska, & Keane, 1993	17 items	DSM-IV
PTSD Checklist (PCL-5)	Weathers, Litz, Keane, Palmieri, Marx, & Schnurr, 2013	20 items	DSM-5
Screen for Posttraumatic Stress Symptoms (SPTSS)	Carlson, 2001	17 items	DSM-IV
Self-Rating Inventory for Posttraumatic Stress Disorder (SRIP)	Hovens, Bramsen, & van der Ploeg (2002)	22 items	DSM-IV
Self-Rating Scale for Posttraumatic Stress Disorder (SRS-PTSD)	Carlier, Lamberts, Van Uchelen, & Gerson, 1998	17 items	DSM-II-R
Trauma Symptom Checklist-40 (TSC-40)	Elliott & Briere, 1992	40 items	No
Trauma Symptom Inventory (TSI)	Briere, 1995; Briere, 1996	100 items	No

Note. DSM = Diagnostic and Statistical Manual of Mental Disorders; PTSD = posttraumatic stress disorder.

One method for assessing PTSD is through a clinical interview. Clinical interviews are conducted by a clinician/researcher who speaks with a patient, usually in person, to assess her/his symptoms. The Clinician Administered PTSD Scale (CAPS; Blake et al., 1995) is often considered the "gold standard" for assessing a diagnosis of PTSD through a clinical interview. The CAPS-5 is the most recent version and corresponds to the DSM-5 (Weathers et al., 2013a). The CAPS-5 can assess PTSD for three different time periods: current (past week), past month, or worst month (lifetime). Like many other measures of PTSD, the CAPS-5 requires the

interviewee to select one traumatic event for the basis of symptoms. The scale takes about 45 to 60 minutes to administer and consists of 30 items, 20 of which assess the DSM-5 symptoms. The additional questions assess onset of symptoms, duration of symptoms, level of distress, and the impact of symptoms on functioning. Severity ratings for symptoms range from 0 (*absent*) to 4 (*extreme* or *incapacitating*).

Although clinical interviews are often the preferred diagnostic tool, there are limitations to conducting them. Therapists and researchers conducting clinical intakes may not have the time to assess for all possible mental health problems and thus may use screening measures or self-report measures to save time. For example, therapists leading weekly group therapy sessions may want to track symptom improvement. However, it is not realistic for a therapist or researcher to conduct a 60-minute interview with 12 different clients before each session. Therefore, having a research participant or therapy client complete a 5- to 10-minute self-report measure can be more efficient than conducting an hour-long CAPS interview.

It has been argued that clinician interviews should be favored over self-report measures of PTSD because individuals in distress may have an altered view of their own symptoms (Enns, Larsen, & Cox, 2000). Additionally, veterans in particular may have incentive to avoid disclosing symptom improvement. Some veterans receive payment for disability-related service connections (i.e., financial compensation based on a disability, either physical or mental health conditions, incurred during active duty in the military; Frueh et al., 2003), and thus may over-report symptoms. Other researchers argue that self-report measures are open to response misinterpretation by the patient (McDonald & Calhoun, 2010). However, in an effort to assess differences in clinician and patient ratings of symptoms of PTSD, Monson and colleagues (2008) assessed correlations between the CAPS and Posttraumatic Stress Disorder Checklist (PCL;

Weathers, Litz, Herman, Huska, & Keane, 1993) in longitudinal treatment outcomes for combat-related PTSD in veterans. The PCL is a 17-item self-report measure that assesses the 17 symptoms of PTSD as outlined by the DSM-IV. The Military Version of the PCL (PCL-M) is one of the most widely used self-report measures of PTSD in the military and in VAs (Fissette et al., 2013). The PCL takes approximately 5 to 10 minutes to complete and is commonly used as a screening and symptom tracking measure at VAMCs. Monson and colleagues found that the CAPS and the PCL were significantly correlated at different time points and across different treatments. Additionally, researchers were more likely to detect symptom improvement on the self-report measures (PCL) compared with clinician ratings (CAPS). Other researchers have also stated that using self-report measures, such as the PCL, is a valid way to track PTSD symptoms (Adkins, Weathers, McDevitt-Murphy, & Daniels, 2008; Karstoft, Andersen, Bertelsen, & Madsen, 2014; Wilkins, Lang, & Norman, 2011). Recently researchers have even found that the PCL retains its psychometric properties even when administered online or on the phone (Boal, Vaughan, Sims, & Miles, 2016).

Veterans with Posttraumatic Stress Disorder

In 2015, more than 1.6 million veterans obtained services from the Veterans Affairs (VA) health system for mental health (U.S. Department of Veteran Affairs, 2016). Of those diagnosed with mental illness, posttraumatic stress disorder (PTSD) and depressive disorders are the two most common diagnoses received (Tanielian & Jaycox, 2008). In 2012, over half a million veterans across all eras received services at VAMCs for PTSD, with the VA spending over $3 billion on the care for those service members and veterans (Institute of Medicine, 2014). Richardson, Frueh, and Acierno (2010) determined from previous studies that the prevalence rates of combat-related PTSD in U.S. military veterans ranges considerably, anywhere from 2%

to 17%. In one sample of veterans who sought primary care services at VAMCs, the prevalence of individuals with a PTSD diagnosis was 11.5% (Magruder et al., 2005). Magruder and colleagues (2005) found that veterans with PTSD were significantly more likely to have the following comorbid issues: major depressive disorder, another anxiety disorder, a substance abuse disorder, suicidality, and worse general health.

The Institute of Medicine (2012) reviewed studies that specifically had military samples and determined that the following variables impact the risk of developing PTSD: age, ethnicity, gender, sexual orientation, education, income, prior trauma (e.g., childhood abuse), and family history of psychological disorders. Other researchers have confirmed that the following are risk factors for developing PTSD in military samples: younger age (Dinenberg, McCaslin, Bates, & Cohen, 2014; Dohrenwend, Turner, Turse, Lewis-Fernández, & Yager, 2008; Schnurr, Lunney, & Sengupta, 2004; Seal, Bertenthal, Miner, Sen, & Marmar, 2007; Smith et al., 2008), lower socioeconomic status (Dinenberg et al., 2014; Schnurr et al., 2004), and lower education (Boscarino, 1995; Dohrenwend et al., 2008, Schnurr et al., 2004; Smith et al., 2008). For veterans who served in combat, being injured or wounded, witnessing death, handling remains, being tortured, and sexual assault were some additional risk factors for PTSD (IOM, 2012). Additionally, not being married (i.e., single, widowed, separated or divorced; Maguen, Ren, Bosch, Marmar, & Seal, 2010; Smith et al., 2008), branch of service (i.e., Army, Marine, or Reserve; Baker et al., 2009; Maguen et al., 2010; Smith et al., 2008), lower rank (Loo et al., 2001), lack of employment (Boscarino, 1995), multiple deployments (Maguen et al., 2010), substance use (Baker et al., 2009; Boscarino, 2006; Boscarino, 2008; Smith et al., 2008), and comorbid psychological problems (Baker et al., 2009; Boscarino, 2008; Dinenberg et al., 2014; Schnurr et al., 2004) have been found to be linked to more severe PTSD for military populations.

Racial Minority Veterans with Posttraumatic Stress Disorder

In an initial assessment conducted by the Institute of Medicine (2012) regarding military personnel and veterans with PTSD, the authors stated that there is some empirical support for the differences in developing PTSD based on race, but that the results of the data are inconsistent across studies. Researchers began examining the connection between race and PTSD as early as 1980. For example, Penk and colleagues (1989) explored differences in PTSD between White, Black, and Hispanic Vietnam veterans who received services from a VAMC. The authors found that Black veterans who experienced high levels of combat had significantly higher scores on a self-report measure of PTSD compared to either Hispanic or White veterans who experienced similar combat. Based on these results, Penk and colleagues (1989) concluded that minority status alone was not what led to a higher severity of PTSD, but that Black Americans may have had different life experiences compared to other minority veterans. For example, it has been argued that Black Vietnam veterans were in a unique situation when they served in combat (Frueh, Brady, & de Arellano, 1998). During the Civil War and Korean War, Black and White soldiers were segregated and placed in separate units. However, the Vietnam War was the first conflict where Black and White soldiers were integrated. Despite the integration, Black soldiers still faced many difficulties. For example, during the Vietnam War many of the White officers were Southern Americans who continued to hold racist attitudes that Blacks were lazy and incompetent (D'Este, 1996).

Other researchers have argued that Asian American Vietnam veterans faced a unique situation that led to race-related PTSD. Frueh and colleagues (1998) explained that U.S. soldiers viewed anyone who was Vietnamese as an enemy, whether they were American soldiers or enemy soldiers. It is possible that this stigma extended to Asians of other cultural backgrounds

(e.g., Japanese, Chinese, Hawaiian, etc.) due to perceived similarities of physical characteristics.

American military personnel were said to have used derogatory terms to refer to anyone Asian,

whether they were American or Vietnamese (Shatan, 1978). In fact, research has shown that

members of a dominant group (Caucasians) label ethnic and racial minorities differently than

those individuals would label themselves (Kiang & Luu, 2013). Matsuoka and Hamada (1991)

interviewed a group of 44 Asian-Pacific American veterans and found that 21% said their

physical characteristics were used when describing the enemy to other soldiers, 29% said they

were called derogatory names by fellow soldiers, 53% said they were at some point mistaken for

Vietnamese while on tour, and 42% reported experiencing an extremely difficult adjustment

once returning to the U.S. These veterans were sometimes even used to role-play war scenarios,

dressing up as the North Vietnamese Army or Viet Cong (Matsuoka & Hamada, 1991). For

Asian American veterans, exposure to race-related stress has been associated with higher scores

on the Brief Symptom Inventory, Beck Depression Inventory, and Mississippi Scale for Combat

Related PTSD (Loo et al., 2001). Additionally, race-related stress was a stronger predictor of

PTSD for Asian American veterans than combat exposure (Loo et al., 2001).

To date, no meta-analysis or literature review has been conducted examining the

differences in PTSD diagnosis or PTSD symptom severity by racial grouping. Furthermore, the

current research that does address differences in PTSD based on race is relatively mixed in

results. Numerous studies have concluded that racial minority veterans were more likely to

develop PTSD compared to their White peers (Beals et al., 2002; Boscarino, 2006; Boscarino,

2008; Dohrenwend, 2008; Fontana & Rosenheck, 1994; Greenawalt et al., 2013; Koenen,

Stellman, Stellman, & Sommer, 2003; Lewis-Fernández et al., 2008; Ortega & Rosenheck, 2000;

Penk et al., 1989; Schnurr et al., 2004; Smith et al., 2008; Sutker, Davis, Uddo, & Ditta, 1995;

Tuerk et al., 2010). Other studies have found no such differences based on race (Baker et al., 2009; Boscarino, 1995; C'de Baca, Castillo, & Qualis, 2012; Macdonald, Greene, Torres, Frueh, & Morland, 2013; Monnier, Elhai, Frueh, Sauvageot, & Magruder, 2002; Rosenheck, Fontana, & Cottrol, 1995; Wolfe, Erickson, Sharkansky, King, & King, 1999). As for Black veterans specifically, the research is also mixed. Some findings support the hypothesis that as a minority group, African Americans are more likely to develop PTSD compared to Whites (Dohrenwend, 2008; Greenawalt et al., 2013; Lewis-Fernández et al., 2008; Penk et al., 1989; Tuerk et al., 2010). However, other researchers have found that African American veterans are not more likely to develop PTSD compared to Caucasians (C'de Baca et al., 2012; Monnier et al., 2002; Rosenheck et al., 1995).

In terms of specific symptom clusters, there is still a dearth of research examining differences based on race and ethnicity. In one study, Black veterans with PTSD reported higher levels of hypervigilance compared to their White peers (Ortega & Rosenheck, 2000). Black veterans also reported higher levels of guilt and avoidance compared to their White peers, but no significant differences in reliving or numbing symptoms (Ortega & Rosenheck, 2000). However, other research has shown very different results. In a sample of almost 80,000 veterans, African Americans endorsed more symptoms of re-experiencing, avoidance, and emotional numbing, but *not* hyperarousal, compared to their Caucasian peers (Koo, Hebenstreit, Madden, & Maguen, 2015).

In some recent studies with larger samples, African American military personnel have higher prevalence rates for PTSD compared to Caucasians. In a recent study of over 20,000 OEF and OIF veterans, participants completed PCL-C and 13.5% screened positive for PTSD (Dursa, Reinhard, Barth, & Schneiderman, 2014). Significantly more deployed non-Hispanic African

American (21.9%) veterans screened positive for PSTD compared to Caucasian veterans (14.1%, $p < .001$) and the same racial differences held true for non-deployed veterans (9.2% versus 15.7%, $p < .001$; Dursa et al., 2014). The authors stated that the analyses were weighted based on participant sex, branch of service, level of education, and year of birth (Dursa et al., 2014).

Greenawalt and colleagues (2013) examined chart records between 2006 and 2009 of over 501,000 veterans who received invasive procedures at VAMCs. The diagnoses of patients in the study were coded and patients were grouped based on PTSD or major depressive disorder diagnosis. The results of study revealed that African American veterans were significantly more likely to be in the "PTSD only" group and significantly less likely to be in the "no PTSD" group compared to their Caucasian peers. Although Greenawalt and colleagues (2013) did not assess era of service, the mean age of the veterans was about 57, suggesting that the majority of the participants may have served in Vietnam. Smith and colleagues (2008) conducted a prospective cohort study and found a number of factors to be associated with PTSD in a sample of over 50,000 service members. Specifically, new onset symptoms of PTSD, as measured by the PCL-C, were more likely in Black non-Hispanic individuals, and those with less education, never married, divorced, and in the Reserve/National Guard or Army branches. Boscarino (2006) sampled over 15,000 male U.S. Army veterans to determine mortality after the military. In a national random sample of veterans, Boscarino (2006) found non-White veterans (30%) were more likely to screen positive for PTSD compared to White veterans (16.4%, $p < .001$). However, Maguen and colleagues (2010) conducted a retrospective cross-sectional study of OEF and OIF veterans who received services from VAMCs and did not find differences in PTSD based on veterans' race. The study included over 300,000 veterans from all branches of service. Maguen and colleagues (2010) examined medical records to determine if veterans had received a

diagnosis of PTSD. Veterans categorized as Black and Other were not significantly more likely to have a diagnosis of PTSD compared to Whites, although Hispanic men were significantly less likely than Whites to be diagnosed with PTSD ($p < .001$).

There are a variety of limitations in many of these studies and the articles presented were only a few of the more recent studies conducted. Many of the researchers coded race as a dichotomous variable (White versus Not White), which then places racial minorities into one heterogeneous group (Boscarino 2006; Boscarino, 2008; Sutker et al., 1995; Wolfe et al., 1999). Not every study controlled for variables that have previously been shown to predict PTSD (e.g., era of service, combat exposure, previous history of trauma, etc.). There is also a large range of sample sizes (from 88 to over 500,000), which makes it difficult to draw conclusions when reviewing the results. Another limitation is that PTSD is measured differently from one study to the next, be it in terms of the type of measure used (e.g., self-report versus clinical interview), the specific measure used (e.g., CAPS, PCL-M, SCID, etc.), or the aspect of PTSD measured (e.g., PTSD diagnosis, severity of PTSD, or specific symptom severity). Overall, the lack of standardization of how PTSD is measured and defined has made it difficult to draw conclusions when looking at differences based on race.

Treatment for Posttraumatic Stress Disorder

Cognitive-behavioral therapies (CBT) have become some of the most commonly used treatment methods for PTSD. CBT is considered the "gold standard" for PTSD treatment, and treatment usually entails 7 to 15 sessions of structured work on changing both cognitions and behaviors (Koucky, Dickstein, & Chard, 2013). Trauma-focused CBT is the first-line treatment for PTSD and has been shown to be effective for reducing symptoms (Bisson, Roberts, Andrew, Cooper, & Lewis, 2013; Ponniah & Hollon, 2009). In 2006 the VA started a nationwide initiative

to train therapists in cognitive processing therapy (CPT) and prolonged exposure (PE) therapy, based on the effectiveness of the two treatments for PTSD (Karlin et al., 2010). CPT is considered a trauma-focused CBT, while PE is considered a trauma-focused exposure therapy. The U.S. Department of Veterans Affairs (2015a, 2015b) outlined four main components for CPT and PE. CPT involves psychoeducation about PTSD symptoms, examining thoughts and feelings, learning CBT skills (e.g., challenging thoughts), and changing problematic beliefs. The four components of PE are: psychoeducation, breathing retraining, exposures, and repeated discussion of the traumatic memories with a therapist. Both CPT and PE have been found to significantly reduce symptoms of PTSD in veteran populations (Forbes et al., 2012; Jeffreys et al., 2014; Macdonald, Monson, Doron-Lamarca, Resick, & Palfai, 2011; Monson et al., 2006). Currently, VAMCs around the country provide individual and group therapy for veterans with various mental health issues, with options for CPT and PE in both group and individual formats.

Group Therapy

Group therapy is one format or modality used to deliver therapy. Other modalities include individual therapy, couples therapy, and family therapy. Similar to other modalities, group therapy can be delivered using different treatment approaches (CBT, CPT, PE, etc.). Group therapy sessions often last longer than individual session (90 minutes compared to 50 minutes). It is common for group therapy sessions to have more than one therapist (co-therapists) in charge of the group. Group therapy may be open or closed; an open group allows for new clients to enter at any point during the therapy, whereas a closed group keeps the same clients during the duration of treatment.

There are many benefits of group therapy for individuals with PTSD that are not possible in individual therapy. Individuals with PTSD often isolate themselves and avoid others, so

meeting in a group format in and of itself helps the individual to fight the avoidance component of PTSD (Ruzek, Young, & Walser, 2003). Ruzek and colleagues (2003) stated that group therapy also can provide education and coping skills. The education can help group members recognize their symptoms and increase understanding, reduce fear, and normalize their experiences. A greater understanding of symptoms of PTSD allows the symptoms to be more predictable, which allows the individual to better cope with them. Group therapy can provide modeling of healthy coping strategies, which for individuals with PTSD, can be essential to help reduce possible comorbid disorders.

Tanielian and Jaycox (2008) found that a quarter of VAMCs are shifting from individual therapy to group therapy to deal with the high demand of veterans with mental illness. Interestingly, among veterans receiving services at VAMCs, Veterans with PTSD are significantly more likely than veterans with other mental health diagnoses to receive group therapy compared with individual therapy (Hunt & Rosenheck 2011). This may be due to the high prevalence of PTSD in returning military populations, increasing demands for services and limited providers, cost-effectiveness of group therapy, or veteran preference for group therapy (Hunt & Rosenheck, 2011). Research has not yet examined the cost-effectiveness of group therapy compared to individual therapy, which may prove to be a different way of comparing effectiveness of treatment (Sloan et al., 2012). Group therapy compared to individual therapy may also result in increased social support or functioning, yet little research has examined these outcomes (Sloan et al., 2012).

Irvin Yalom, perhaps one of the most influential group psychotherapists, states that there are 11 primary therapeutic factors in group psychotherapy: instillation of hope, universality (i.e., having shared experiences), imparting information, altruism, corrective recapitulation of the

primary family group, development of socialization techniques, imitative behaviors, interpersonal learning, group cohesiveness, catharsis, and existential factors (Yalom & Leszcz, 2005). A number of these therapeutic factors may benefit military personnel who suffer from PTSD. Group therapy often normalizes one's experiences, and creates a sense of universality, thus reducing feelings of isolation that are common in military personnel with PTSD. Group members often share similar experiences (universality), which may help to reduce feelings of stigma, shame, and guilt. Military personnel who have PTSD may feel stigma and shame simply for having a mental illness and they may experience shame or guilt around the traumas that they experienced. Additionally, the group can normalize reactions to traumatic events since survivors of trauma often feel alone in their experiences. For example, a veteran with PTSD may realize that she or he is not the only person who checks her or his locks and doors to ensure safety.

Despite how often group therapy is used as a modality of treatment for PTSD, little research has been conducted assessing the effectiveness of group therapy for PTSD (Sloan et al., 2012). Although group therapy is not considered a "first-line" treatment by the VA or Department of Defense, it is commonly practiced at VAMCs (Sloan et al., 2012). Some researchers state that group therapy is not as effective as individual therapy for treating PTSD, even though group therapy has been found to be better than no treatment for reducing symptoms of PTSD (Sloan et al., 2012). Group therapy has been found to reduce symptoms other than PTSD. For example, McDermut, Miller, and Brown (2001) conducted a meta-analysis of 48 studies that supported that group therapy is as effective as individual therapy for individuals with depression.

Overall, the literature on group therapy for military populations with PTSD is still very young and much more research still needs to be conducted (Sloan et al., 2012). A recent meta-

analysis examined the effectiveness of group therapy for individuals with PTSD (Sloan, Feinstein, Gallagher, Beck, & Keane, 2013). Sloan and colleagues (2013) found that for individuals in group therapy, PTSD symptom reduction varied based on their type of trauma. In other words, effect sizes for group therapy were smaller in samples with combat-related PTSD compared to mixed-trauma sample studies (Sloan et al., 2013). In discussing these findings, Sloan and colleagues noted the possibility that individuals with combat-related PTSD were more likely to experience repeated traumatic events, which could explain why non-military samples reported more improvement after group therapy. However, a limitation to Sloan and colleagues' (2013) meta-analysis was that there were only four studies with combat-related PTSD samples.

A number of studies, all of which used the PCL, have shown that a variety of different group therapy modalities effectively reduce symptoms of PTSD for veterans (Beidel, Frueh, Uhde, Wong, & Mentrikoski, 2011; Castillo, C'de Baca, Qualls, & Bornovalova, 2012; Ellis, Peterson, Bufford, & Benson, 2014; Schnurr et al., 2003; Strachan, Gros, Ruggiero, Lejuez, & Acierno, 2012; Sutherland et al., 2012; Tuerk et al., 2010). For example, a CBT group therapy program for combat veterans ($N = 496$) with PTSD in Australia significantly reduced PCL scores at post-treatment and scores remained reduced 9 months after therapy (Khoo, Dent, & Oei, 2011). Forbes, Creamer, & Biddle (2001) examined a 12-week group treatment program for Vietnam veterans ($N = 97$). Although the type of treatment was not specified, symptoms of PTSD were reduced with an effect size of $d = .59$ on PCL measures from pre- to post-treatment (Forbes et al., 2001). In addition to CBT therapies, exposure-based group therapy has been used and found to significantly reduce symptoms of PTSD (Beidel et al., 2011; Castillo et al., 2012; Sutherland et al., 2012). Ready, Vega, Worley, and Bradley (2012) conducted group-based exposure therapy for combat veterans ($N = 30$) with PTSD and found a significant and large

effect (Cohen's $d = .89$) of group therapy on PCL scores. These combat veterans continued to have significant symptom reduction 7 months after therapy ended. Additionally, group therapy using CPT has also been effective in reducing PTSD symptoms assessed by the PCL in veterans (Alvarez et al., 2011; Jeffreys et al., 2014).

Racial Composition in Groups

Various factors unique to group therapy may affect treatment outcomes (e.g., racial composition, gender composition, group size, group cohesion, group norms, client characteristics). As early as 1979, Dr. Larry Davis questioned whether there was a certain racial composition that would either improve or impede progress in therapy, whether the size of the group mattered, or whether the race of the therapist was important. Other authors have posed the same question regarding the impact of racial composition on group therapy outcomes (Riva & Smith, 1997). Vasquez and Han (1995) argued that homogeneous groups offer more immediate trust and cultural understanding which may then lead to better group cohesion. Yalom (2005), a famous group therapist, theorized that heterogeneity in groups is important because it allows therapy to be more closely aligned with the real world, as the group develops into a "social microcosm."

Additionally, research suggests that therapy group norms are often based on Caucasian norms and may therefore affect minority clients in unique ways (Eason, 2009; Tsui & Schultz, 1988). Tsui and Schultz (1988) stated:

> It would be naive to assume that a minority group member would not react negatively–
> either on a conscious or subconscious level– to a majority of Caucasians who all share
> common values and behavior and are trying to assimilate the minority member into what
> they see as the therapeutic milieu. (p. 137)

Racial minority clients may also approach the racial composition of a group differently from Caucasian clients for a number of different reasons. Ofori-Dankwa and Julian (2002) explained that if only one member of a racial minority group was present in a therapy group, that individual may have felt pressure to be the token representative for all members of that racial group. These authors argued that a single racial minority client in a therapy group may have felt less connected to other members or less able to share about race-related issues in the group setting. Consequences of a homogeneous group for a racial or ethnic minority member may include reduced participation in the group or discontinuing therapy. Thus, it could be argued that at least two minority group members are required for better therapeutic outcomes. Thus, the number of minority group members in a group and the therapeutic group norms may all affect treatment outcomes.

Contrary to Yalom's view that group heterogeneity is beneficial, some social psychology theories and research suggest that higher homogeneity in groups is beneficial. For instance, theories of self-categorization (Turner, 1985), social identity (Tajfel & Turner, 1979), and similarity-attraction (Berscheid & Walster, 1978; Byrne, 1971) each suggest that individuals prefer to be in groups (therapeutic or nontheraputic) with others who are similar to themselves, as opposed to out-group members.

Despite these theoretical arguments for studying racial or ethnic composition of therapy groups, extremely limited research has examined how the racial composition of therapy groups influences outcomes such as symptom resolution, group cohesion, and attrition rates. Although Davis noted in 1979 that racial composition was an important variable to study, Davis has only conducted research on non-therapeutic groups. Other researchers have more recently noted the importance of studying the relationship between racial composition and group therapy outcomes.

For example, Paulus and colleagues (2015) asserted that "it is important to study CBT outcome(*s*) in minority samples and to investigate the role of racial/ethnic composition in group therapy" (p. 65).

Racial Composition in Therapy Groups

One unpublished dissertation study examined the racial composition of therapy groups. In 2010, Obasaju recruited 34 African Americans with social anxiety to examine how the racial composition of groups affected outcomes. It was hypothesized that if a participant was the only African American in a group therapy session, she or he would be more likely to drop out, compared to if she or he was in a group with other African Americans. Participants were assigned to a virtual reality exposure therapy, enhanced cognitive behavioral group exposure therapy, or a waitlist control group. However, only 23 individuals received group therapy. Of those receiving group therapy, 13 dropped out. Chi-square analyses were conducted and no significant differences were found in the rates of dropout based on the racial composition of the group. However, a major limitation to this study is that the sample size was very small. Due to the small sample size, each of the 11 different groups had a maximum of five participants enrolled. High dropout rate (57%) likely influenced rapport building, group cohesion, and other characteristics of these groups. This study also used dichotomous coding of racial composition (i.e., one African American in a group or more than one African American in a group) instead of assessing the percentage of racially concordant group members. The author also did not indicate whether the treatment was manualized. As there is a lack of literature regarding what group therapy factors are influenced by racial composition, it is important to note whether group therapy is interpersonally focused or manualized. It could be hypothesized that non-manualized

groups allow for more open-ended discussions and interpersonal connection, which could be influenced by the racial composition of the group.

Campbell and Alexander (2002) examined data from 618 outpatient substance abuse treatment centers. They assessed whether the centers offered single-race therapy groups and whether there were any associations between having single-race therapy groups and patient outcome data (e.g., utilization of other services). Centers with single-race therapy groups were more likely to have clients who received financial counseling and transportation assistance. However, the authors did not discuss the racial composition of the single-race therapy groups. Thus, it is unclear, for example, how many therapy groups were composed of all Caucasian patients and how many were composed of all African American patients. It is also unclear whether there were differences between those two types of groups (i.e., all-Caucasian versus all-African American) in patient outcomes.

Ard and colleagues (2008) conducted a 20-week group-based behavior modification program for weight loss. The research had multiple sites with locations in Baltimore, MD, Baton Rouge, LA, and Durham, NC. The groups consisted of either one race (all African American participants) or mixed race participants. The researchers were interested in whether racial concordance of the groups was associated with weight loss and therapy dropout. Ard and colleagues found no statistical differences in session attendance, lifestyle changes, or weight loss for participants based on the racial composition of the groups (i.e., all African American versus "mixed race"). However, for the mixed race groups, the authors were not able to assess whether the percentage of African American participants was associated with differences in outcomes. This was due to the fact that the racial composition variable was highly correlated with the site location (i.e., Baltimore, Baton Rouge, or Durham). The mixed race groups also had a high

percentage ($M = 56\%$; range of 23% to 90%) of African American participants, which the authors argue may have led to a group environment similar to that of a group with all African American participants. Additionally, the authors noted that the intervention was already tailored to be culturally appropriate for African American clients, and thus racial composition of the groups may have mattered less than in a program that was not culturally sensitive.

Racial Composition in Patient-Provider Relationships

Exploring the association between racial composition in community clinics and outcome data, Koizumi and colleagues (2011) assessed data from adults seeking therapy at 20 different outpatient treatment centers. The authors hypothesized that clients may seek providers or treatment settings in which there are more clients who are racially or ethnically concordant with themselves. Even after the distance of the clinic was taken into account, the results suggested that clients chose programs based on the racial composition of the client population served by the clinic. Furthermore, the racial composition of the clients at a clinic was a significant factor in choosing a treatment center for both African Americans and Caucasians, although this tendency was found to be more prevalent for the Caucasian participants. The authors were not able to ascertain why participants preferred treatment centers with higher percentages of same-race clients. The authors also did not collect any data related to group therapy at the clinics.

The race of the provider in a group setting may also affect clients' experiences. Both therapists and co-therapists have a large influence on the group discussion and group norms. The amount of cultural competence of the group therapy provider will also affect the group as a whole as well as minority members. For example, in one study, African American veterans stated that Caucasian therapists may lack cultural sensitivity (Castro et al., 2015). Furthermore, in focus groups investigating veterans' preferences for group therapy, "issues of [provider's] race

were not discussed by European American participants," suggesting that Caucasian clients may be less attuned to race-related matters (Castro et al., 2015, p.335).

The data regarding the importance of client-provider racial/ethnic concordance in group therapy are mixed. In a sample of women with PTSD and substance use who were receiving group therapy, White participants with higher PTSD symptoms at baseline who had White therapists showed greater PTSD symptom reduction compared to White participants who had non-White therapists (Ruglass et al., 2014). Interestingly, Black women in this study did not show such benefits based on racial matching with their therapist. Ruglass and colleagues (2014) also assessed another variable related to client-therapist racial matching in the groups. This second variable, the group racial/ethnic match, was based on the proportion of group members who were concordantly racially/ethnically matched with their group therapist. The values of this group variable ranged from 0 (none of the group members had concordantly matched group therapist) to 1 (every group member had a concordantly matched group therapist). This variable of group race/ethnic matching with provider was not significantly associated with session attendance or PTSD symptom reduction. Similarly, Obasaju (2010) found no significant differences in dropout rates for African Americans based on the race of the co-therapist (Caucasian versus African American). These results suggest that the racial or ethnic concordance of a group therapy member with the provider may be more important for Caucasians than for African Americans.

Similar to mixed findings in studies assessing the influence of racial composition on group therapy outcomes, findings regarding the importance of therapist-client racial concordance in individual therapy are also mixed. Maramba and Hall (2002) conducted a meta-analysis of ethnic matching between clients in individual therapy and their psychotherapists. Clients who

were concordantly matched were less likely to drop out, and this effect was stronger for ethnic minority clients than for Caucasians. Another set of researchers examined outcomes for ethnic minority patients who had either ethnically matched or non-matched providers in individual therapy (Farsimadan, Draghi-Lorenz, & Ellis, 2007). The researchers found that therapy outcomes, bond with the therapist, and therapist credibility were all significantly better in ethnically matched dyads. The bond with the therapist did mediate the relationship between matching dyads and therapy outcomes, such that the ethnic matching no longer predicted therapy outcomes when the bond with the therapist was taken into account.

In a recent meta-analysis of client-therapist racial/ethnic concordance, researchers found that clients have a moderately strong preference for therapists who are racially similar and perceive those therapists more positively than racially discordant therapists (Cabral & Smith, 2011). African American clients showed strong preferences for racially concordant therapists and evaluated their therapists more positively when they were racially concordant. Cabral and Smith hypothesized that the results could be due to there being some wariness by African American clients when matched with White providers.

However, other researchers have found that the racial matching of clients and providers in individual therapy has little or no effect on treatment outcomes. Despite Cabral and Smith's (2011) finding that racial concordance was related to preference and perception, they also found that racial/ethnic matching between clients and therapists did *not* affect mental health outcomes overall. Another more recent study examined racial concordance between older adult clients (i.e., 65 years or older) and their individual therapists (Presnell, Harris, & Scogin, 2012). The authors found no significant association between racial matching and session attendance, reduction of symptoms, or quality of therapy sessions.

Racial Composition in Non-Therapeutic Groups

Research focusing on how the racial composition of non-therapeutic groups is associated with various outcomes has proven complicated. Jackson and colleagues (2003) reviewed over 60 studies focusing on team and organizational diversity. They stated that the effect of diversity on non-therapeutic team processes is complex, with mixed results regarding the effects of "racio-ethnic" group diversity on team performance (Jackson, Joshi, & Erhardt, 2003). For example, diversity was associated with negative affect only some of the time (Jackson, Joshi, & Erhardt, 2003). Additionally, the exact nature of what group heterogeneity should look like in practice is unknown and researchers have questioned whether the association between diversity factors and non-therapeutic group outcomes is even linear (Davis, Cheng, & Strube, 1996; Ofori-Dankwa & Julian, 2002). For example, Davis and colleagues (1996) argued that the association between group composition and member satisfaction may be a complex relationship (e.g., a U-shaped model) within which exists a "tipping point" (e.g., that there must be at least two or three members of a minority group to affect outcomes). It should be noted that many of these studies regarding non-therapeutic group outcomes and diversity are fairly dated, and thus there may be different findings if the studies were replicated now.

Some research suggests that the level of diversity in a non-therapeutic group will affect outcomes. The racial composition of non-therapeutic groups has been shown to affect participant enjoyment and performance on tasks (Paletz, Peng, Erez, & Maslach, 2004). Additionally, greater intergroup contact has been found to be associated with less intergroup prejudice (Pettigrew & Troop, 2006). In a meta-analysis of college experiences and cognitive development, Bowman (2010) found that diversity workshops, diversity coursework, and interactions with "nonracial diversity" were all positively associated with cognitive growth.

Furthermore, diverse racial interpersonal interactions were also significantly related to cognitive growth.

Moreover, the racial composition of non-therapeutic groups may affect racial minority individuals differently than Caucasian individuals. Davis (1979) conducted an analog study and found that when African American participants had to select members for a group project, they were significantly more likely than Caucasian participants to weigh race as a factor (compared to name, age, academic major). Davis also found that the more intimate the group setting, the more likely African Americans were to choose a more highly concordant racial group composition. Thus, when afforded the opportunity to determine the racial make-up of groups, African Americans and Caucasians may make different choices. Similarly, Troop and Pettigrew (2005) found that the association between intergroup contact and prejudice differs for minority (i.e., low status) and majority groups, as well as for racial and ethnic minority and majority groups. The authors found that contact-prejudice relations were weaker in minority compared to majority groups. In other words, compared to individuals from minority groups, members of majority groups (Caucasians) were more likely to have a reduction in prejudice when encountering people from minority groups. Furthermore, compared with majority group members, minority group individuals who have contact with majority group members would experience less of a reduction in prejudice. Therefore, a racially diverse group may lead to different experiences for members depending on whether an individual is in the majority or the minority group.

Other researchers have found a negative or non-significant relationship between diversity and group outcomes. For example, Webber and Donahue (2001) conducted a meta-analysis examining employment groups and job-related outcomes and found a non-significant relationship between diversity and both group cohesion and team performance. The authors

explained that inconsistent findings in past research may have been due to a lack of differentiation among distinct types of diversity and/or the lack of a theoretical framework for understanding how different types of diversity affect group outcomes (Webber & Donahue, 2001).

Racial Composition in Non-Therapeutic Dyads

Research has demonstrated that an individual's race or ethnicity may be associated with a number of factors in non-therapeutic interpersonal dyad situations. For example, an individual's race has been shown to be associated with both affective and behavioral responses toward others. Trawalter and Richeson (2008) conducted research examining dyadic relationships between Black and White college students to examine both verbal and nonverbal responses during conversations about race-related and race-neutral topics. Results showed that White participants reported more anxiety in interracial dyads compared with same-race dyads, regardless of whether the discussion focused on race-related topics. White participants also displayed more behavioral anxiety compared to their Black peers while in interracial dyads. However, the anxiety was dependent on the discussion topic, such that White participants showed more anxiety while discussing race-related matters (compared with race-neutral topics) with another White participant, but there were no significant differences in anxiety when paired with a Black partner. Furthermore, Black participants showed less anxiety during race-related topics (compared with race-neutral topics) in interracial dyads. Thus, not only does the racial composition of the dyads matter, but the context of the discussion affects anxiety levels in interpersonal situations. Other researchers have examined factors associated with the racial concordance between patients and providers in dyadic relationships (particularly in medical settings). For example, researchers have found that African Americans were more likely to report increased satisfaction when seen

by African American doctors and less likely to report satisfaction when treated by Caucasian doctors (LaVeist & Carroll, 2002). Additionally, African Americans tended to rate their providers higher when there was racial concordance between themselves and their providers (Chen, Fryer, Phillips, Wilson, & Pathman, 2005).

Research findings regarding the association between group diversity and outcomes have been inconsistent both in non-therapeutic settings (Bowman, 2010, Jackson et al., 2003; Webber & Donahue, 2001) and therapeutic settings (Ard et al., 2008; Koizumi et al., 2011; Obasaju, 2010). It is apparent that race influences interpersonal dynamics in non-therapeutic dyads (LaVeist & Carroll, 2002; Trawalter & Richeson, 2008), non-therapeutic groups (Paletz et al., 2004), individual therapy (Cabral & Smith, 2011), and at therapy clinics (Campbell & Alexander, 2002; Koizumi et al., 2011). Despite some evidence indicating that racial composition plays an important role in a variety of interpersonal outcomes, limited research examines how the racial composition of therapy groups influences treatment outcomes. However, in two studies that did explore racial composition in therapy groups, no association was found between racial composition and treatment outcomes (Ard et al., 2008; Obasaju, 2010). Yet the studies by Ard and colleagues and Obasaju assessed racial composition of groups as a dichotomous variable instead of measuring the percentage of the group that was a particular race. Thus, additional research should be conducted measuring racial composition as a continuous variable. It would also add to the current literature to explore the association between racial composition and outcomes in studies that focus on specific populations (such as veterans).

Racial Differences in Treatment Effectiveness

Many factors influence the type of treatment provided and treatment outcome, one of which is the client's race. In terms of receiving services, Black veterans have been found to be

17% less likely than White veterans to receive any psychotherapy services, 25% less likely to receive individual therapy, and 25% more likely to receive group therapy at VAMCs (Hunt et al., 2011). Black veterans have also been found to receive significantly fewer psychotherapy sessions (including group therapy) compared with White veterans (Hunt & Rosenheck, 2011). In a sample of OEF/OIF veterans, Mott, Barrera, Hernandez, Graham, and Teng (2014) found that ethnic minority veterans were more likely to be referred to group therapy than individual therapy compared to White veterans. There are many plausible explanations for these findings, but further research will need to be conducted to gain a better understanding.

There has been a lack of research examining differences in psychotherapy outcomes based on race for individuals with PTSD (Lester et al., 2010). Lester and colleagues (2010) examined the impact of race on treatment outcomes in individual therapy for women ($n = 321$) who experienced interpersonal violence and had PTSD. The participants were randomly assigned to three conditions: CPT, PE, or wait-list. Lester and colleagues (2010) found that there was no difference between African American and Caucasian women in PTSD symptom reduction after receiving individual therapy. However, the authors did find that African Americans were significantly more likely to drop out of treatment. Zoellner, Feeny, Fitzgibbons, and Foa (1999) found similar results for a group of African American and Caucasian women. They assessed 95 women who experienced assaults and found no differences in PTSD symptom reduction based on race after participants had individual CBT.

Similar results have been found in military samples with PTSD. In a more recent study by Gros, Yoder, Tuerk, Lozano, and Acierno (2011), researchers assessed treatment effectiveness of individual exposure therapy delivered via telehealth ($n = 37$) to a sample of veterans with PTSD at a VAMC. The participants were reported as 50.0% Caucasian and 45.2% African American,

with about an equal split serving in OIF/OEF and Vietnam wars. The researchers found no differences in treatment effectiveness for PTSD symptoms between African American and Caucasian veterans.

Some of the researchers who have examined race and symptom reduction in military samples with PTSD did not clearly report the type of therapy individuals received. Rosenheck and colleagues (1995) assessed treatment outcomes for veterans with PTSD across different VAMCs and found that Black veterans ($n = 910$) had higher PTSD symptom severity at baseline compared with White veterans ($n = 3,816$). The study included veterans who received either individual or group therapy but the researchers did not differentiate symptom improvement based on type of therapy received. Rosenheck and colleagues (1995) found no significant differences in PTSD symptom improvement based on veterans' race, although Black veterans were significantly more likely to drop out of treatment. Interestingly, racial pairings between clinicians and veterans also impacted premature termination. In a second study, Rosenheck and Fontana (1996) specifically examined whether race impacted symptom outcomes for veterans with PTSD. The sample included 122 Black and 403 White veterans who received services at various VAMCs. The researchers did not specify the type of therapy the veterans received or whether veterans had significant symptom reduction. Rosenheck and Fontana (1996) did find that there were no significant differences based on race for PTSD symptom improvement.

Other researchers have examined individual therapy compared to group therapy for military personnel with PTSD. Jeffreys and colleagues (2014) conducted a retrospective chart review of veterans with PTSD who obtained services at VAMCs. The authors compared individual CPT, CPT group, CPT group and individual combined, and individual PE therapy for 263 individuals. The majority of the sample was Hispanic (55.9%), followed by White (32.3%),

African American (9.1%), and Other (2.7%). The results of the study indicated that both CPT

(group and individual therapy) and PE therapy led to significant reductions in PTSD symptoms.

Despite a small number of racial minority veterans across each group, the authors found that

African American veterans ($n = 9$) were more likely than Caucasians ($n = 26$) to have symptom

improvement after completing PE in individual therapy. Due to the small sample of African

American participants in the PE group, the authors cautioned against over-interpreting the

results. There were no significant differences found based on veterans' race for treatment

effectiveness of CPT group therapy.

In studies assessing group therapy for military personnel with PTSD in inpatient units,

researches have not found differences in treatment effectiveness based on race. Alvarez and

colleagues (2011) examined the treatment effectiveness of CPT group therapy for male veterans

($n = 104$) with PTSD compared to veterans who did not receive treatment. The participants

received treatment through a VAMC residential program. Forty percent of the sample who

received CPT were classified as non-White. The authors found no significant differences in

treatment effectiveness based on participants' race. Ellis and colleagues (2014) assessed inpatient

CPT group therapy for military personnel who served in OEF and OIF. The participants ($N = 38$)

were 63.2% Caucasian, 13.2% African American, 10.5% Latino(a), 7.9% Pacific Islander, 2.6%

Arabic, and 2.6% Native American/Alaska Native. The authors found that demographic variables

were not associated with post-test scores on PTSD measures.

Similar results have been found in outpatient group therapy for military personnel with

PTSD. Harris and colleagues (2011) examined the effectiveness of a spiritually focused group

therapy program for veterans ($n = 26$) compared to a control group. Treatment was conducted

either at a VAMC or at a local religious community organization. Seventy-four percent of the

total sample identified as Caucasian who were compared to the remaining participants

(categorized as racial minorities). The authors hypothesized that racial minority veterans would

have greater symptom reduction compared to Caucasians because the groups had a spiritual

focus. Harris and colleagues (2011) noted that the sample size was a limitation of the study but

that there was a subsignificant ($p = .08$) trend in the analyses to suggest that spiritually-focused

group therapy could be more beneficial for reducing PTSD in racial minority groups compared to

Caucasians.

A number of studies have explored treatment effectiveness for group therapy in military

personnel but disregarded participants' race. Some of the research has been conducted in other

countries and ethnicity was not specified: Croatia (Britvić et al., 2012), Australia (Khoo, Dent, &

Oei, 2011), and the Netherlands (Rademaker, Vermetten, & Kleber, 2009). Despite a range in

reported sample sizes (from 37 to 4,339), a number of studies did not mention participants' race

(Forbes et al., 2001; Forbes, Parslow, Fletcher, McHugh, & Creamer, 2010; Forbes, Lewis,

Parslow, Hawthorne, & Creamer, 2008; King et al., 2013). Even more studies cited participants'

race, but did not examine whether there were differences based on race in symptom reduction

after group therapy. Researchers did not report differences in PTSD based on race for smaller

samples with less than 100 participants (Castillo et al., 2012; Kearney, McDermott, Malte,

Martinez, & Simpson, 2012; Long et al., 2011; Mott et al., 2013; Ready, Sylvers, et al., 2012;

Ready, Vega, et al., 2012; Sutherland et al., 2012) or for samples with over 100 participants

(Bolton et al., 2004; Dunn et al., 2007; Morland et al., 2010; Morland et al., 2014; Ready et al.,

2008; Schnurr et al., 2003). Thus, a large number of the studies regarding group therapy for

military personnel with PTSD do not take race into account when assessing symptom reduction.

Despite the dearth of research on the topic, findings suggest that treatment outcomes for individuals with PTSD do not differ based on the race of the client.

Health Disparities Research

The U.S. Department of Health and Human Services (2000) defines *health disparities* as "differences that occur by gender, race or ethnicity, education or income, disability, geographic location, or sexual orientation" (p. 11). Health disparities may be differences in physical or mental health outcomes. For example, an individual's life expectancy, morbidity, or quality of life may be worse simply because the person is a racial minority or has less education than someone else. Not only are there discrepancies in health outcomes for certain groups of people, there are also disparities in access, utilization, and quality of medical care (Pamuk, Makuc, Heck, Reuben, & Lochner, 1998). Over the past two decades, the U.S. government has created science-based objectives (Healthy People 2010 and Healthy People 2020) to reduce health disparities with the goal to "achieve health equity, eliminate disparities, and improve the health of all groups" (U.S. Department of Health and Human Services, 2014, para. 3). As the population of the U.S. continues to increase, so does the number of individuals who face health disparities. For example, as of 2015, approximately 38.4% of the U.S. population identified as a racial or ethnic minority (U.S. Census Bureau, 2016). Not only do racial and ethnic minority groups make up a growing percentage of the U.S. population, but these groups of individuals are disproportionately affected by various health concerns.

African Americans face certain disadvantages compared to Caucasians that inevitably affect their physical and mental health. Non-Hispanic Blacks are more likely than Whites to be unemployed and unemployment is related to poorer reported health (Centers for Disease Control and Prevention, 2013). Both non-Hispanic Blacks and individuals with less education are more

likely to work in high-risk occupations (Centers for Disease Control and Prevention, 2013). Compared to other racial groups, non-Hispanic Blacks have some of the highest fatality rates for every industry sector (Centers for Disease Control and Prevention, 2013). Among adults ages 18-64, non-Hispanic Blacks are significantly more likely to be uninsured compared to Whites (Centers for Disease Control and Prevention, 2013). Of adults who live below the federal poverty level, non-Hispanic Blacks and Hispanics make up the highest percentage (Centers for Disease Control and Prevention, 2013). Vaccination coverage for the flu has been found to be lowest among non-Hispanic Blacks compared to all other racial or ethnic groups (Centers for Disease Control and Prevention, 2013).

Numerous studies have focused on the physical health disparities of African Americans. During gestation and at birth, racial status has been associated with negative health outcomes. On average, African American babies have been found to be smaller and less likely to survive their first year, compared to babies from other racial groups (Adler & Rehkopf, 2008). African Americans as a group have worse health and higher mortality than any other racial group in the U.S. (Adler & Rehkopf, 2008). Blacks have higher rates of hypertension and complications related to the disorder (Roger et al., 2012), and are more likely to die from hypertensive heart disease and pulmonary circulation compared to Whites (Adler & Rehkopf, 2008). Non-Hispanic Black women are more likely than White women to be obese (Centers for Disease Control and Prevention, 2013). In 2010, non-Hispanic Blacks had rates of tuberculosis that were eight times higher than for Whites (Centers for Disease Control and Prevention, 2013). Even after controlling for income, education, gender, and age, Blacks have significantly higher blood pressure, inflammation, and total health risk factors compared to Whites (e.g., blood pressure, metabolic, and inflammation risk factors; Crimmins et al., 2007).

Research focusing on mental health disparities has not been as clear-cut as the research on physical health disparities. Data from numerous studies actually support that Whites have worse (Himle et al., 2009) or similar mental health compared to African Americans (Rosenthal & Wilson, 2012). For example, Whites have been found to have a higher risk of developing generalized anxiety disorder, social anxiety, or panic disorders than African Americans (Himle et al., 2009). Rosenthal and Wilson (2012) found no significant differences in psychological distress based on race/ethnicity in a sample of 954 youth who were Asians, African-Americans, Hispanic/Latinos, and Whites. However, some research has demonstrated African Americans have worse mental health compared to Whites. For example, multiracial adolescents have been shown to have higher levels of depressive symptoms than Caucasian youth (Fisher, Reynolds, Hsu, Barnes, & Tyler, 2014). Williams and Mohammed (2009) also found mental health disparities to be significantly associated with racial minority status. African American and Caribbean Black individuals have reported higher cumulative and immediate risk of PTSD over their lives compared to Whites (Himle et al., 2009). African Americans have been found to have significantly higher rates of PTSD during their life compared to non-Hispanic Caucasians, even after controlling for sociodemographic factors and social support (Alegria et al., 2013).

Discrimination is one potential explanation for why health disparities exist for minority groups. In a literature review conducted by Giurgescu, McFarlin, Lomax, Craddock, and Albrecht (2011), the authors found that racial discrimination predicted lower preterm birth, low birth weight, and very low birth weight. The authors of another meta-analysis reviewing health disparities established that perceived discrimination (based on race, sexual orientation, gender, or other factors) was significantly associated with worse mental and physical health (Pascoe & Richman, 2009). Discrimination can directly affect access to and quality of health care. One

study found that 29% of non-Hispanic Blacks, 22% of Mexican, 23% of Puerto Rican participants reported experiencing some level of discrimination in health care settings (Benjamins & Whitman, 2014). Furthermore, experimental research has produced evidence that discrimination manipulations lead to increases in negative physiological response (e.g., systolic blood pressure, diastolic blood pressure, mean arterial pressure, etc.), especially those related to the stress response system (Pascoe & Richman, 2009).

Discrimination is significantly associated not only with worse physical health outcomes, but also worse mental health related outcomes (Benjamins & Whitman, 2014). Racial and ethnic discrimination and perceived discrimination are significantly associated with increased depression, psychological distress, suicidal ideation, chronic stress emotions, anger, anxiety, drug use, and PTSD, in addition to lower levels of well-being, self-esteem, life satisfaction, quality of life, and positive affect (Williams & Mohammed, 2009; Williams et al., 2003). Pieterse, Todd, Neville, and Carter (2012) conducted a meta-analytic review including 66 studies and found a positive association between racism and mental distress for Black Americans. One study found that Hispanic veterans who reported more race-based discrimination also reported higher rates of PTSD compared to veterans who did not report as high of rates of discrimination (Ruef, Litz, & Schlenger, 2000). Additionally, racism has been found to significantly predict psychiatric symptoms for Blacks, even after controlling for demographic variables and general stress (Klonoff, Landrine, & Ullman, 1999).

Brondolo, Brady ver Halen, Pencille, Beatty, and Contrada (2009) examined the research regarding individual-level coping strategies to deal with interpersonal racism. Brondolo, Brady ver Halen, and colleagues (2009) identified three coping strategies based on the research: racial identify development, seeking social support, and anger management. For example, the authors

found 12 peer-reviewed studies that explored whether racial identity buffered the negative effects of racism (Brondolo, Brady ver Halen, et al., 2009). However, the authors concluded that there have not been any strategies identified yet that effectively offset the mental and physical health consequences of racism (Brondolo, Brady ver Halen, et al., 2009).

Minority Stress Model

The minority stress model was conceptualized by Ilan Meyer and proposes that individuals who are in a minority position in society face unique stigmatization which then leads to stress and other negative health outcomes. In 1995, Meyer examined how the stigmatization of homosexuality, and resulting chronic stress, impacted gay men in New York. Meyer (1995) found that internalized homophobia, stigma, and prejudice were all significantly and independently associated with negative psychological outcomes (e.g., demoralization, guilt, suicidal ideation and behavior, and AIDS-related traumatic stress response). Additionally, the predictors combined, led to a two- to threefold increase in distress for individuals. In 2003, Meyer continued his work with a meta-analysis that examined the minority stress model but focused more broadly on lesbian, gay, and bisexual individuals. Again, Meyer (2003) found that minority status was significantly associated with negative mental health outcomes.

Meyer's minority stress model has been supported by other researchers. In 1954, Allport discussed how negative interactions with others can negatively affect an individual from a minority group. Lazarus and Folkman (1984), known for the transactional model of stress and coping, suggested that conflict between an individual and her/his experience in society leads to social stress. Selye (1982) was one of the first researchers to describe the biological basis of stress through the general adaptation syndrome. In his model, Selye (1982) explained that individuals who face stress in their environment must return to homeostatis (i.e., a biological

regulation to be balanced), otherwise there may be negative long-term health consequences. Pascoe and Richman (2009) suggested a similar theory to the minority stress model for how perceived discrimination affects mental and physical health. These researchers proposed that perceived discrimination activates the human stress response. Individuals have what is known as an allostatic load, or the cumulative wear and tear on the restorative and regulatory systems in the body due to stressors (McEwen, 1998). With chronic and persistent discrimination, an individual's allostatic load heightens, which then negatively affects the individual's mental and physical health.

Although Meyer's initial research began by focusing on how minority stress affected sexual minorities, over time his theory has extended to other minority groups. For example, racial minorities may deal with both acute and chronic stressors that impact their mental and physical health. The minority stress model suggests that the cumulative effect of these stressors then leads to health impairment. Harrell (2000) suggested at least six different types of race-related stressors that individuals of minority racial groups may face: race-related life events, vicarious racism experiences, daily racism microstressors, chronic-contextual stress, collective experiences or racism, and the transgenerational transmission of group traumas. Research has only just begun to examine how these race-related stressors and other forms of discrimination affect minority groups' mental and physical health.

According to the minority stress model, African Americans are subject to higher levels of stress due to discrimination based on their minority racial status. Pascoe and Richman (2009) found discrimination leads to an increase in negative physiology related to the stress response system. Furthermore, African Americans have been found to have significantly higher allostatic loads in comparison to Caucasians (Deuster, Kim-Dorner, Remaley, & Poth, 2011). Higher

allostatic loading, which leads to dysregulation of the autonomic nervous system, is one possible cause of an anxiety disorder. Moreover, it is not surprising that findings from research demonstrate that discrimination leads to an increase in anxiety (Williams & Mohammed, 2009; Williams et al., 2003). One of the criteria of PTSD, which was classified as an anxiety disorder in the DSM-IV, is an increase in arousal. Thus, the minority stress model suggests that discrimination based on race may lead to higher stress. Higher stress can lead to higher arousal, which may explain why African Americans have been found to have higher rates of PTSD (Alegria et al., 2013; Himle et al., 2009). Although the current study will not test the minority stress model, it is important to consider the model in conceptualizing the experiences of African Americans.

Transgenerational Trauma Theory

The understanding of how trauma may be transmitted from one individual to another is still not well understood (Baranowsky, Young, Johnson-Douglas, Williams-Keeler, & McCarrey, 1998). There are different names for theories that address the transgenerational effect of trauma: intergenerational transmission of trauma, second generation trauma, historical trauma, transgenerational transmission of trauma, and transgenerational trauma (Albeck, 1994; Barocas & Barocas, 1973; Brave Heart, 1998; Danieli, 1982; Prince, 1985; Schulberg, 1997). Families may consciously or unconsciously carry values, myths, or beliefs that may or may not be part of the larger society that may be passed down to the next generation (Danieli, 1982). Similarly, behaviors, attitudes, or feelings may be taught to subsequent generations or learned through modeling. Transgenerational transmission has been explored in family systems theories, which suggest that an individual is best understood in relation to their family. One such theory is the Bowenian family systems theory. Dr. Murray Bowen (1976) proposed a multigenerational

transmission process in which issues such as anxiety get passed from one generation to another. Bowen is one of many theorists who lend an understanding of how the effects of a traumatic event may be passed through generations.

A traumatic event often changes how an individual perceives his/her world and experiences. As stated in the DSM-5 criteria, PTSD may result in an individual having exaggerated negative beliefs about the world; for example, that no one can be trusted or that the world is completely dangerous. However, traumatic events do not happen only to an individual. A traumatic event can also happen to a family, a community, or another group of individuals with a shared identity. The trauma(s) may be a single event or re-occurring events, such as colonialism (i.e., political acquisition of territory), war, slavery, genocide, neighborhood violence, or a natural disaster. Some examples of communities and the traumatic events that may have influenced those individuals' lives include: Jews and the holocaust, Tutsi and the Rwandan genocide, South Africans and apartheid, New Orleanians and Hurricane Katrina, and New Yorkers and the September 11, 2001 attacks. There are also certain racial and ethnic groups in the Unites States who have experienced large scale traumatic events: Native Americans, Japanese Americans, and African Americans.

African Americans have a unique history in the U.S. Through slavery, individuals were kidnapped, taken away from their homes and family, sold as property, beaten, raped, and tortured. Even after slavery ended, Jim Crow laws continued to uphold racism and racial segregation. African Americans were not allowed the same rights or privileges as other, be it a right to vote, to equal education, to housing, to marry, or to employment. The historical events that have taken place in the U.S. have impacted African Americans as a community. Alexander, Everman, Giesen, Smelser, and Sztompka (2004) explain that "cultural trauma occurs when

members of a collectivity feel they have been subjected to a horrendous event that leaves indelible marks upon their group consciousness, marking their memories forever and changing their future identity in fundamental and irrevocable ways" (p. 1). Thus, African Americans carry with them the traumatic history that their ancestors endured in the U.S. which continues to impact their lives today.

Although the current study will not test transgenerational trauma theory, this model suggests that African Americans in particular have a unique history in America. The transgenerational trauma theory provides a theoretical explanation for why African Americans would have higher severity of PTSD. For example, the race-based stress that African American veterans face can lead to an increase in their distress, which then compounds their symptoms of PTSD. In particular, race-based stress may increase the allostatic load, which would specifically affect the PTSD symptom of hyperarousal for African American veterans.

Statement of the Problem

Due to the recent military conflicts (OEF/OIF/OND) in which the U.S. is involved, the number of veterans continues to increase. PTSD is one of the most prevalent mental health diagnoses for veterans and can be a debilitating illness. Although there has been a great deal of research exploring various aspects of PTSD, much less research has examined whether there are racial differences in severity of PTSD between veterans of different races. Another area that has been understudied is the effectiveness of group therapy for veterans with PTSD and whether there are differences in treatment effectiveness based on veterans' race.

The current study examined whether there were differences in PTSD symptomology based on veterans' race and whether group therapy effectively reduced symptoms of PTSD. The following hypotheses were tested:

1. Non-Hispanic African American male veterans will report more severe PTSD symptoms at intake compared to non-Hispanic Caucasian male veterans.

2. Non-Hispanic African American male veterans will report more severe PTSD symptoms for the symptom cluster of hyperarousal (i.e., cluster D in DSM-IV) at intake compared to non-Hispanic Caucasian male veterans.

3. The PTSD Recovery Program will be effective for non-Hispanic Caucasian veterans.

4. The PTSD Recovery Program will be effective for non-Hispanic African American veterans.

One additional research question was examined:

1. Is the racial composition of therapy groups associated with treatment outcomes (e.g., PTSD symptom reduction or session attendance)?

Method

Participants

Participant data were gathered from two sources: McGuire VAMC electronic medical records (Computerized Patient Record System (CPRS; VA Software) and PTSD Recovery Program evaluation data. All patients were enrolled in the PTSD clinic, an outpatient program at the McGuire VAMC. The inclusion criteria were initiation in a combat-related PTSD Recovery Program (and thus a diagnosis of PTSD) at the McGuire VAMC PTSD clinic between 2010 and 2014, male sex, non-Hispanic Caucasian or non-Hispanic African American race, and completion of a Posttraumatic Stress Disorder Checklist- Military version measure at intake, pre-treatment, or post-treatment.

Participant demographic information and military history can be found in Tables 2 and 3. Data for a total of 515 individuals were initially gathered for this study. Because analyses were

conducted on a group level, data for individuals who did not meet the inclusion criteria were gathered to calculate certain variables (e.g., group size, racial composition of groups). After exclusion criteria were applied, a total of 450 individuals were included in the analyses. The average age of participants was 54.56 (SD = 13.65), with a range of 23 to 89 years of age. The majority of veterans were African American (n = 278, 62%), married (n = 303, 67%), and fit the employment status of disabled, pensioner, or retired (n = 240, 53%). Three veterans declined to report their race but identified as Hispanic. Four veterans stated their race was unknown, of whom three identified as Hispanic. All seven of those veterans were excluded from analyses. The most common level of education was 12 years (n = 202, 45%).

Medical records provide only one era of service for each veteran and thus veterans were not coded as serving in multiple eras of service. The VA provides definitions of the following periods of service: World War (April 6, 1917 to November 11, 1918), Korean conflict (June 27, 1950 to January 31, 1955), Vietnam era (February 28, 1961 to May 7, 1975), and Gulf War (August 2, 1990 to present). The majority of veterans either served in the Persian Gulf War (n = 204, 45%) or the Vietnam Era War (n = 206, 46%). Most veterans had served in the Army (n = 317, 70%), followed by the Marines (n = 55, 12%), the Air Force (n = 20, 4%), and the Navy (n = 20, 4%). The most common enlisted ranks were E-4 (n = 139, 31%), E-5 (n = 94, 21%), E-7 (n = 50, 11%), and E-6 (n = 49, 11%).

Table 2

Participant Demographics

Characteristic	African American		Caucasian		Total	
	n = 278	(61.8%)	*n* =172	(38.2%)	*N* = 450	(100%)
Age (*M*, *SD*)	54.71	(12.5)	54.32	(15.36)	54.56	(13.7)
Race/Ethnicity						
African American	278	(100.0)	0	(0.0)	278	(61.8)
Caucasian	0	(0.0)	172	(100.0)	172	(38.2)
Marital Status						
Divorced	50	(18.0)	25	(14.5)	75	(16.7)
Married	178	(64.0)	125	(72.7)	303	(67.3)
Never married	20	(7.2)	12	(7.0)	32	(7.1)
Separated	14	(5.0)	5	(2.9)	19	(4.2)
Widowed	8	(2.9)	3	(1.7)	11	(2.4)
Missing	8	(2.9)	2	(1.2)	10	(2.2)
Education						
Less than 12 years	6	(2.2)	4	(2.3)	10	(2.2)
G.E.D./high school diploma/12 years	126	(45.3)	76	(44.2)	202	(44.9)
13-15 years	43	(15.5)	25	(14.5)	68	(15.1)
Bachelor degree/16 years	76	(27.3)	47	(27.3)	123	(27.3)
Post-bachelor degree/ over 16 years	17	(6.1)	14	(8.1)	31	(3.6)
Missing	10	(3.6)	6	(3.5)	16	(3.6)
Employment status						
Disabled/pensioner/ retired	140	(50.4)	100	(58.1)	240	(53.3)
Stable employed	96	(34.5)	48	(27.9)	144	(32.0)
Unemployed	30	(10.8)	14	(8.1)	44	(9.8)
Missing	12	(4.3)	10	(5.8)	22	(4.9)

Table 3

Participant Military History

Characteristic	African-American		Caucasian		Total Sample	
	n = 278	(61.8%)	*n* =172	(38.2%)	*N* = 450	(100%)
Period of Service						
Korean War	0	(0.0)	1	(0.6)	1	(0.2)
Persian Gulf War	127	(45.7)	77	(44.8)	204	(45.3)
Post Korean War	0	(0.0)	1	(0.6)	1	(.2)
Post Vietnam War	28	(10.1)	9	(5.2)	37	(8.2)
Vietnam Era War	122	(43.9)	84	(48.8)	206	(45.8)
WWII	1	(0.4)	0	(0.0)	1	(.2)
Branch of Service						
Air Force	9	(3.2)	11	(6.4)	20	(4.4)
Army	212	(76.3)	105	(61.0)	317	(70.4)
Marines	25	(9.0)	30	(17.4)	55	(12.2)
Navy	13	(4.7)	7	(4.1)	20	(4.4)
Multiple	1	(0.4)	2	(1.2)	3	(0.7)
Missing	18	(6.5)	17	(9.9)	35	(7.8)
Highest Enlisted Military Rank						
E-1	1	(0.4)	0	(0.0)	1	(0.2)
E-2	4	(1.4)	3	(1.7)	7	(1.6)
E-3	15	(5.4)	6	(3.5)	21	(4.7)
E-4	93	(33.5)	46	(26.7)	139	(30.9)
E-5	50	(18.0)	44	(25.6)	94	(20.9)
E-6	30	(10.8)	19	(11.0)	49	(10.9)
E-7	34	(12.2)	16	(9.3)	50	(11.1)
E-8	14	(5.0)	8	(4.7)	22	(4.9)
E-9	13	(4.7)	4	(2.3)	17	(3.8)
W-1	0	(0.0)	0	(0.0)	0	(0.0)
W-2	1	(0.4)	1	(0.6)	2	(0.4)
W-3	0	(0.0)	3	(1.7)	3	(0.7)
W-4	1	(0.4)	1	(0.6)	3	(0.7)
W-5	0	(0.0)	0	(0.0)	0	(0.0)
O-1	0	(0.0)	0	(0.0)	0	(0.0)
O-2	1	(0.4)	0	(0.0)	1	(0.2)
O-3	2	(0.7)	7	(4.1)	9	(2.0)
O-4	3	(1.10)	1	(0.6)	4	(0.9)
O-5	2	(0.7)	0	(0.0)	2	(0.4)
O-6	2	(0.7)	2	(1.2)	4	(0.9)

(Table continues)

Table 3 (continued)

Participant Military History

	African-American		Caucasian		Total Sample	
	M	SD	M	SD	M	SD
Total Service Connection	68.95	(26.69)	70.06	(24.92)	69.37	(26.01)
Percent Service Connected for PTSD	40.88	(27.94)	38.51	(26.75)	39.98	(27.49)

Note. Total Service Connection = financial compensation based on any disability incurred during active duty in the military; Percent Service Connected for PTSD = financial compensation based on PTSD disability incurred during active duty in the military.

There was a fair amount of diagnostic co-morbidity in the sample (Table 4). Fifty-nine percent of the veterans had co-morbid mood disorders and 37.8% had co-morbid substance use disorders. A smaller minority of the sample had co-morbid anxiety disorders (12.9%), cognitive disorders (9.8%), or personality disorders (1.1%). Most veterans denied a history of childhood abuse (77.3%). Of those veterans with a history of childhood abuse (18.4%), emotional abuse (13.6%) was the most commonly reported, followed by physical abuse (11.3%), then sexual abuse (2.4%). Pearson chi-square tests for association were conducted between race and mental health variables. All expected cell frequencies were greater than five, except for the categories of personality disorders and sexual abuse. There was a statistically significant association between race and cognitive disorders, $\chi^2(1) = 5.61$, $p = .02$. Non-Hispanic Caucasian veterans were more likely than non-Hispanic African American veterans to have a diagnosis of a cognitive disorder. There was also a statistically significant association between race and childhood abuse, $\chi^2(1) = 4.49$, $p = .03$. Non-Hispanic Caucasian veterans were more likely to have reported a history of childhood abuse.

Table 4

Differences in Mental Health Variables Assessed with Pearson Chi-Square Tests

Characteristic (*n*, %)	Non-Hispanic African-American		Non-Hispanic Caucasian		Total Sample		*p*
	n = 278	(61.8%)	*n* = 172	(38.2%)	*N* = 450	(100%)	
Diagnosed Disorders							
Anxiety	33	(11.9)	25	(14.5)	58	(12.9)	.41
Cognitive	20	(7.2)	24	(14.0)	44	(9.8)	.02*
Mood	159	(57.2)	107	(62.2)	266	(59.1)	.28
Personality	2	(.7)	3	(1.7)	5	(1.1)	--
Substance Use	114	(41.0)	56	(32.6)	170	(37.8)	.09
History of Childhood Abuse							.03*
No	224	(80.6)	124	(72.1)	348	(77.3)	--
Yes	43	(15.5)	40	(23.3)	83	(18.4)	--
Missing	11	(4.0)	8	(4.7)	19	(4.2)	--
Type of Childhood Abuse							
Emotional Abuse	32	(11.5)	29	(16.9)	61	(13.6)	.09
Physical Abuse	26	(9.4)	25	(14.5)	51	(11.3)	.08
Sexual Abuse	7	(2.5)	4	(2.3)	11	(2.4)	--

Note. No tests were conducted on the personality disorder or sexual abuse category due to low sample size.
*p < .05. **p < .01.

Provider demographic information can be found in Table 5. There were a total of twenty different providers who led or co-led the groups. The majority of providers were female (*n* = 15, 75%). A total of 17 clinicians provided complete responses to demographic information. Of those who provided information, the average age as of 2014 was 39.24 years old (*SD* = 11.25) and the average number of years of clinical experience was 11.41 (*SD* = 8.53). The majority of clinicians were non-Hispanic Caucasian (*n* = 15, 88% of those who responded) and the most common degree was a Doctorate of Psychology (Psy.D; *n* = 6, 43% of those who responded). A main provider for each group was identified to allow for analyses at the provider level. This

provider was the therapist with the most experience. Data from a total of 11 providers were used in the final analyses. The demographic characteristics of these providers ($n = 11$) were similar to the characteristics for the total sample (mean age = 45.44, $SD = 11.35$; mean years of clinical experience = 17.56, $SD = 6.88$; 100% non-Hispanic Caucasian; 64% with a doctorate degree). The eleven main providers were involved in between one and 13 different groups, with an average of four and a half groups and a modal number of two groups.

Table 5

Provider Demographics

Characteristic	*M*	*SD*
Age[a]	39.24	(11.3)
Therapeutic experience in years (*M, SD*)[a]	11.41	(8.5)
	n	(%)
Gender		
Female	14	(70.0)
Male	6	(30.0)
Race/Ethnicity		
Black or African American	1	(5.0)
Hispanic or Latino	1	(5.0)
Non-Hispanic Caucasian	15	(75.0)
Missing	3	(15.0)
Degree		
Doctor of Philosophy (Ph.D.)	3	(15.0)
Doctor of Psychology (Psy.D.)	6	(30.0)
Masters of Social Work (MSW)	3	(15.0)
Graduate Psychology student	3	(15.0)
Graduate Social Work student	1	(5.0)
Other	1	(5.0)
Missing	3	(15.0)

[a]Missing data for three providers.

Measures

Client Demographics. Electronic medical records (CPRS) were reviewed to gather demographic information for veterans: participant age, sex, race, ethnicity (e.g., Hispanic or non-Hispanic), marital status, education, employment status, period of service (e.g., Vietnam,

OEF/OIF/OND), branch of service, highest enlisted rank, percent service connected for PTSD (financial compensation based on a disability incurred during active duty in the military), total service connection, diagnoses (e.g., mood disorder, substance use disorder), and previous trauma history. Data for participant diagnoses were gathered from both the Active Problem List in CPRS (list of all medical and mental health diagnoses) and from the diagnoses listed in the medical chart for the PTSD Outpatient Intake session. Both program evaluation data and medical records were reviewed to gather information for the Recovery Program group therapy providers. Finally, the number of PTSD Recovery Program group sessions attended was calculated after medical chart review was conducted. Group therapy dropout was calculated by determining whether veterans attended eight or more sessions, as the veterans must repeat the group therapy if they miss more than 2 of the 10 sessions. Additionally, the length of time between intake and pre-treatment was calculated using the date the veteran had a PTSD intake session and the date they had their first group therapy session.

Provider Demographics. A list of the providers who conducted therapy was gathered from the PTSD Recovery Program evaluation data. Clinicians were contacted by email and asked to provide the following information: age (as of 2014), gender, ethnicity, highest degree earned, and years of clinical experience (as of 2014). Clinicians were explicitly told that they were not required to provide information and that any information they provided would be discussed in aggregate in the current study.

Posttraumatic Stress Disorder Checklist-Military Version. The Posttraumatic Stress Disorder Checklist- Military Version (PCL-M; Weathers et al., 1991; see Appendix B) was the primary measure used in the study. The PCL-M consists of 17 items and takes about 5 to 10 minutes to complete. Respondents answer the questions based on symptoms that have occurred

in the last month using a 5-point Likert scale (1 = *not at all*, 5 = *extremely*). The instructions state: "*Below is a list of problems and complaints that veterans sometimes have in response to a stressful military experience. Please read each one carefully, put an "X" in the box.*" None of the items on the PCL-M are reverse coded. A total score is calculated by summing scores on all items, with totals ranging from 17 to 85 (higher scores indicating more severe PTSD).

Although Weathers and colleagues (1993) as well as other researchers (Forbes et al., 2001) suggested a total score of 50 for diagnosing PTSD in combat veterans, and an item score of 3 or more out of 5 for symptom criteria, other researchers have suggested a higher total score cutoff of around 60 (Keen, Kitter, Niles, & Krinsley, 2008). The U.S. Department of Veterans Affairs (2014) suggests a PCL cutoff score of 30 to 35 for civilian primary care settings, 36 to 44 for specialized medical clinics or VA primary care clinics, and 45 to 50 for VA mental health clinics. It is noted by the VA (2014) that the recommended cut-offs are "general and approximate" and "research is needed to establish optimal cut-point scores for a specific application" (p. 2). Karstoft and colleagues (2014) compared different PCL cutoff scores to the Structured Clinical Interview for the DSM-IV (SCID; First, Spitzer, Gibbon, & Williams, 2002) with a military sample, and determined that the PCL performed well (high sensitivity and specificity) with a cutoff score of 53. Currently, the PTSD clinic at the Richmond VAMC uses a total score of 55 as an indicator of a PTSD diagnosis. In terms of symptom improvement, the VA suggests that a 5-point decrease indicates that an individual has responded to treatment, while a 10-point decrease indicates clinically significant change (U.S. Department of Veteran Affairs, 2012). Other researchers agree that a 10-point change indicates clinically significant improvement (Monson et al., 2008). In the current study, total symptom scores were calculated for the PCL-M. Additionally, total symptom cluster scores for the PCL-M were created

according to the four DSM-5 symptoms clusters and based on research by Maestas and

colleagues (2011). Because the PCL-M has been shown to map onto the DSM-5 (See Table 6;

Maestas et al., 2011), the 17 items were divided into the four DSM-5 PTSD symptom clusters:

re-experiencing (items 1-5), avoidance (items 6-7), numbing (items 8-12), and hyperarousal

(items 13-17).

Table 6

Posttraumatic Stress Disorder Checklist- Military Version (PCL-M)

Item	DSM-IV Clusters	Suggested Four-Factor Model (DSM-5 Clusters)
1. Repeated, disturbing memories, thoughts, or images of a stressful military experience?	B1	Reexperiencing
2. Repeated, disturbing dreams of a stressful military experience?	B2	Reexperiencing
3. Suddenly acting or feeling as if a stressful military experience were happening again (as if you were reliving it)?	B3	Reexperiencing
4. Feeling very upset when something reminded you of a stressful military experience?	B4	Reexperiencing
5. Having physical reactions (e.g., heart pounding, trouble breathing, or sweating) when something reminded you of a stressful military experience?	B5	Reexperiencing
6. Avoid thinking about or talking about a stressful military experience or avoid having feelings related to it?	C1	Avoidance
7. Avoid activities or situations because they remind you of a stressful military experience?	C2	Avoidance
8. Trouble remembering important parts of a stressful military experience?	C3	Numbing
9. Loss of interest in things that you used to enjoy?	C4	Numbing
10. Feeling distant or cut off from other people?	C5	Numbing
11. Feeling emotionally numb or being unable to have loving feelings for those close to you?	C6	Numbing
12. Feeling as if your future will somehow be cut short?	C7	Numbing
13. Trouble falling or staying asleep?	D1	Hyperarousal
14. Feeling irritable or having angry outbursts?	D2	Hyperarousal
15. Having difficulty concentrating?	D3	Hyperarousal
16. Being "super alert" or watchful on guard?	D4	Hyperarousal
17. Feeling jumpy or easily startled?	D5	Hyperarousal

Note. Factor model from Maestas, Benge, Pastorek, LeMaire, & Darrow, 2011. An expanded version of this table can be found in Appendix C.

The PCL-M is the main assessment instrument used at the McGuire VAMC PTSD clinic for intakes and therapy sessions. The U.S. Department of Veterans Affairs (2014) has suggested that the PCL can be used for monitoring symptom change during treatment, screening veterans for PTSD, and for making provisional diagnoses of PTSD. Additionally, the PTSD checklist is one of the most commonly used tools for screening for PTSD by the Department of Defense (IOM, 2012). In the current study, the PCL-M was used to assess severity of overall PTSD at intake, pre-treatment, and end of treatment, as well as specific PTSD symptom (re-experiencing, avoidance, numbing, and hyperarousal) severity. There are three versions of the PCL, all of which were developed based on DSM-IV diagnostic criteria (Keen et al., 2008; McDonald & Calhoun, 2010). The items and scoring are the same on all three versions of the PCL; however, the instructions for the measure differ slightly. The PCL-M (military) is often used with military populations, and the directions include the words "response to stressful military experience." The PCL-C (civilian) is used with civilian populations, and items do not refer to one particular traumatic event; instead, the directions state to rate symptoms based on "stressful life experiences." Last, the PCL-S (specific) is also used with civilian populations and items refer to a specific traumatic event. The instructions for the PCL-S are the same as for the PCL-C, except that there is an added sentence, "the event you experienced was ___ on _____ (date)." Although a new version, the PCL-5, has been created (Weathers, Litz, et al., 2013) to match the DSM-5, the PCL has previously been found to reliably assess the four clusters of PTSD proposed by the DSM-5 (re-experiencing, avoidance, numbing, and hyperarousal; Asmundson et al., 2000; Fissette et al, 2013; Maestas et al., 2011). The McGuire VAMC has not transitioned to using the PCL-5; thus, the current study used scores based on the PCL-M.

Overall, the PCL has been shown to have strong psychometric properties. Adkins and colleagues (2008) examined the psychometric properties of seven different self-report measures of PTSD and found that the PCL was significantly correlated with various other measures of PTSD: Posttraumatic Stress Diagnostic Scale (.75; Foa, 1995), Clinician-Administered PTSD Scale total severity score (.65), Davidson Trauma Scale (.74; Davidson et al., 1997), Civilian Mississippi Scale (.68; Vreven, Gudanowski, King, & King, 1995), Impact of Events Scale-Revised (.70; Weiss, 2004), Penn Inventory for PTSD (.66; Hammarberg, 1992), and the PK scale of the Minnesota Multiphasic Personality Inventory (.58; Keane, Malloy, & Fairbank, 1984). Additionally, the PCL had a 1-week test-retest reliability of .87 and internal consistency of .91. Discriminant validity was assessed by comparing the PCL to measures of depression, anxiety, and social phobia, and the PCL was significantly moderately associated with all three measures (correlations ranging from .34 to .63). The authors argued that another point of discriminant validity was that the PCL had weaker correlations with non-DSM correspondent measures. Adkins and colleagues (2008) concluded their study of the seven self-report measures by stating that data support the use of the PCL for measuring PTSD. Other researchers found similar results, stating that the PCL measures the construct of posttraumatic stress (Fissette et al., 2013).

Additional evidence has been found to support the psychometric properties of the PCL. Internal consistency has ranged from the mid to high .90s (Keen et al., 2008). Two- to three- day test-retest reliability has been found to be .96 (Weathers et al., 1993). The PCL has demonstrated acceptable diagnostic accuracy in establishing a change in PTSD from pre- to post-treatment (Forbes, Creamer, & Biddle, 2001). Convergent validity has been assessed by examining correlations between the PCL and other measures of PTSD. For example, Blanchard, Jones-

Alexander, Buckley, and Forneris (1996) compared the PCL to the "gold standard" Clinician

Administered PTSD Scale (CAPS; Blake et al., 1990) and found that scores were highly

significantly correlated ($r = .93$). In a longitudinal study of PTSD, ratings of symptoms on the

CAPS and the PCL have been found to be significantly correlated (Monson et al., 2008).

Researchers have found that all 17 items of the PCL were significantly correlated to the

corresponding items on the CAPS. Other researchers (Ruggiero, Del Ben, Scotti, & Rabalais,

2003) have found the PCL to significantly correlate with the Mississippi Scale for PTSD-

Civilian version (.82; Vreven et al., 1995) and the Impact of Event Scale (.77; Horowitz, Wilner,

& Alvarez, 1979).

Limited research has focused on the psychometric properties of the PCL in African

American samples. Goldmann and colleagues (2011) conducted research on over 1,000 African

American adult civilians living in Detroit, over 87% of whom had experienced traumatic events

in their life. The PCL-C in this sample had an internal consistency of .93. A subsample of

participants ($n = 51$) from the study underwent an additional clinical interview to assess PTSD

symptoms using the CAPS, and the PCL-C continued to display good psychometric properties

(sensitivity = .24, specificity = .97, positive predictive value = .80, and negative predictive value

= .72). However, researchers still recommend that additional research should be conducted to

examine the psychometric properties of the PCL during research involving African American

samples (Malcoun, Williams, & Nouri, 2015).

The PCL demonstrates good psychometric properties in studies that assess PTSD in

military samples. Cronbach's alpha has been found to be .90 for the total scale and .77 to .89 for

subscales (Alvarez et al., 2011). In a sample of veterans with combat-related PTSD, Forbes,

Parslow, Fletcher, McHugh, and Creamer (2010) found the PCL to have a test-retest reliability of

.96 and an internal consistency reliability coefficient of .97. Wilkins and colleagues (2011) reviewed over 70 studies that used the PCL and summarized psychometric properties for the PCL-C, PCL-S, and PCL-M. In studies with Vietnam veterans with PTSD, the PCL-M had a kappa of .64 with the section of the SCID that assessed PTSD (Weathers et al., 1993).

Procedure

Data were obtained from records review and self-report measures previously completed as part of the PTSD Recovery Program. IRB approval was obtained through Virginia Commonwealth University and the McGuire VAMC IRB (IRB#02076). Due to the archival nature of the study, a request to waive informed consent was submitted as part of the IRB process and was approved. Participants were veterans who received services at the McGuire VAMC and were referred to a PTSD Recovery Program group. Before enrollment in the PTSD Recovery Program, veterans must first attend a PTSD orientation session, attend an intake session with a clinician in the PTSD clinic, and then receive a referral to group therapy after the clinician deems it as an appropriate therapeutic modality (see Figure 1). The data for this study were taken from Recovery Groups that consist of combat veterans. Separate group therapy exists specifically for female veterans with military sexual trauma PTSD, veterans with non-combat PTSD, and veterans with substance abuse and PTSD (i.e., Seeking Safety). Data from veterans participating solely in those groups were not examined in this study.

Consort Diagram of PTSD Clinic
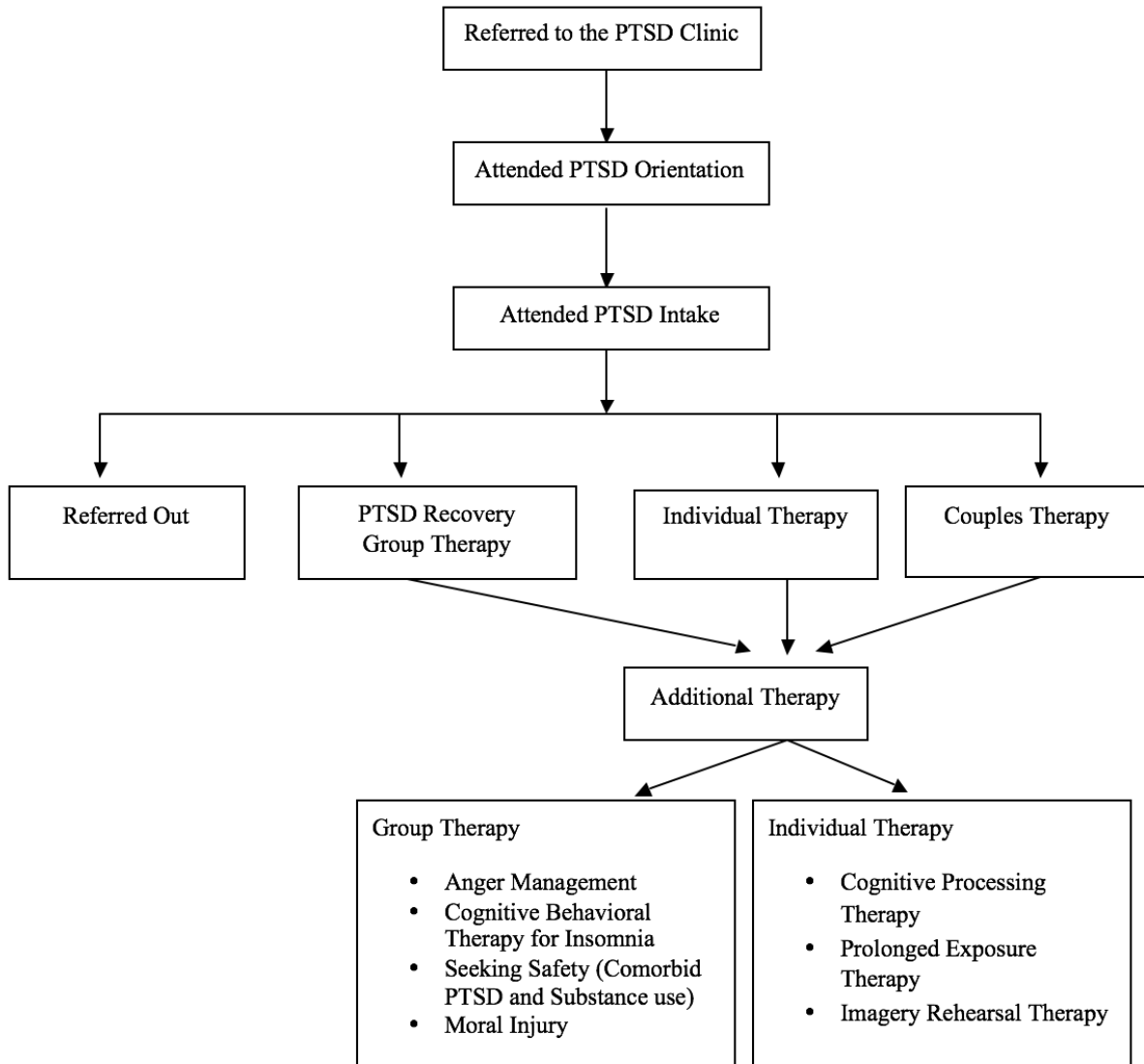
Figure 1. Consort Diagram of the PTSD Clinic at McGuire Veterans Affairs Medical Center

The PTSD Recovery Program consisted of 10 weekly group therapy sessions that lasted

for 90 minutes each. The Recovery Program was designed to be provided to roughly 5 to 14

veterans in each group. Clinicians (e.g., licensed psychologists, licensed social workers, graduate

students in psychology, and graduate students in social work) followed the PTSD Recovery

Program manual (2010) developed by Dr. John Lynch and Ms. Laurin Mack, two therapists from

the McGuire VAMC. Typically, 1 or 2 clinicians ran each group; however, sometimes trainees sat in on a group. Group therapy sessions generally started with the therapist doing a check-in to see how the week was for the veterans or to assess how homework assignments went. Next, the group leader(s) and veterans covered the agenda material for the particular session. Both group leaders and veterans had a copy of the Recovery Program manual during the session so that everyone could follow along with the material being discussed. An overview of the agenda for the Recovery Program manual can be found in Appendix D. The Recovery Program is a skills-based modality that includes elements of psychoeducation, cognitive behavior therapy, in vivo exposure, stress management, acceptance and commitment therapy, mindfulness, and interpersonal effectiveness skills training. Clinicians who run Recovery Program group therapy administer pre- and post-treatment measures for all participants to assess improvement on various psychological measures. Veterans enrolled in the Recovery Program complete self-report measures at the beginning of the first group therapy session (Session 1) and at the beginning of the final group therapy session (end of treatment). Clinicians record group attendance and write client notes, which are documented in each veteran's medical file. Veterans' demographic information (e.g., age, race, rank, etc.) was obtained from medical record reviews.

Data Analysis

The data were analyzed using both SPSS version 22.0 and R version 0.98.1028 (packages: psych, nlme, ggplot2). The program RStudio was used to conduct Linear Mixed Modeling (i.e., MLM). The term "mixed" (Linear Mixed Modeling) implies that there are both fixed and random effects (Heck, Thomas, & Tabata, 2014). Fixed effects are variable coefficients that stay constant across individuals or groups (e.g., average PCL-M total score at intake); whereas random effects are variable coefficients that can vary across individuals or

groups (e.g., PCL-M total score at intake based on the age of the veteran). Both slopes and intercepts can have random effects; however, a fixed effect must be determined before estimating a random effect.

Using statistical analyses that account for multilevel or nested data is the optimal way to analyze the data in the current study. Figure 2 provides a detailed image to help conceptualize this multilevel model. The main outcome variable in this study was PCL-M total scores. The reason these data are nested, is because change in symptoms may not simply be due to individual differences, but rather due to effects of the group or effects of different providers (Kahn, 2011). This is because veterans sharing a common group are more similar to each other than they are to veterans from different groups. In this model independent variables are as follows (see Figure 2): Level 1 data are time (changes in pre- to post-treatment), Level 2 data are individual characteristics (e.g., era of service, race, marital status), Level 3 data are group characteristics (e.g., size of the group), and Level 4 data are provider characteristics (e.g., years of experience).

Figure 2.

Multilevel Model of the Current Study

Level 4 or l: 1   1   …   11
Providers

Level 3 or k: 1   2   …   50
Therapy groups*

Level 2 or j: 1   2   3   1   2   … 8   1   2   … 14
Individuals

Level 1 or i: Time   Pre-, post-   Pre-, post-treatment   Pre-, post-
                  treatment   treatment
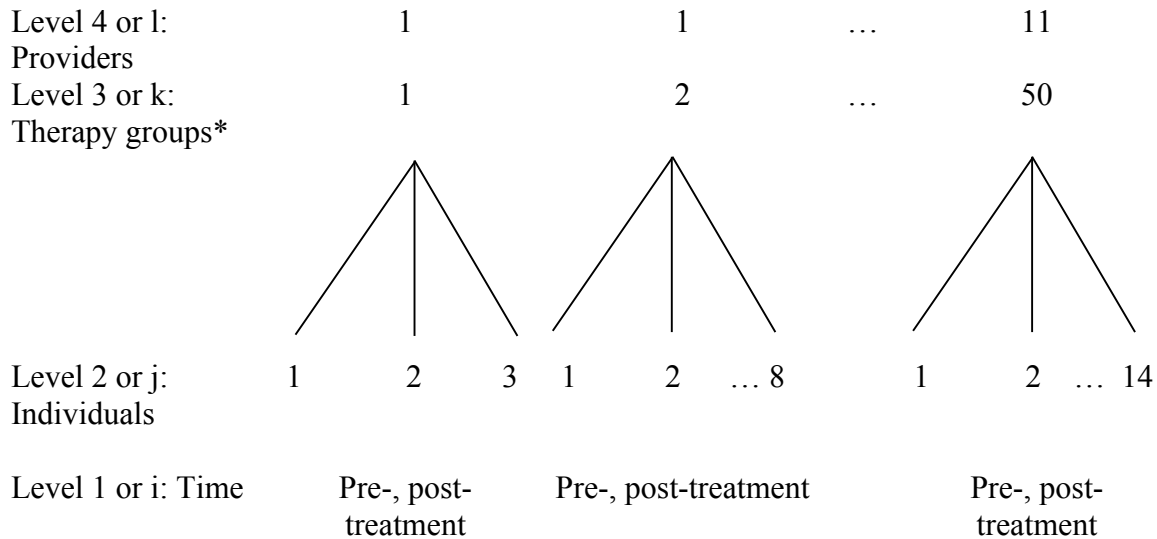
Figure 2. Time is the within-subject variable which is nested within individual, nested within groups, nested within providers. Groups, provider, and individual characteristics are between-subject variables.
The final model used in analyses was a three-level model, due to a lack of variance in therapy groups.

For example, it is plausible that a provider with 25 years of experience has clients who gain better symptom reduction compared to a provider with only 5 years of experience. Thus, it would then be expected that any therapy group with this experienced provider would have individuals with significantly different outcomes (as measured by the PCL-M) compared to individuals working with other providers. Likewise, it is possible that groups with fewer members see more symptom reduction because each veteran would have more individual contact with the provider. In this case individuals in different groups would show significantly different outcomes based on their group membership because of the size of the group. Conceptualizing a four-level model allows for each of these variables to be accounted for in the analyses.

There are various benefits to using MLM. One of the main benefits is that MLM is often a preferred technique used with data that are hierarchical or nested (e.g., individuals within groups). MLM accounts for the nonindependence due to nested data (i.e., individuals nested in a therapy group, nested in a particular provider). Ignoring this nonindependence of observations can lead to small standard errors and an increased Type I error (Hox, 2010). MLM can also estimate both fixed effects and deviations in those effects at each level (e.g., variation in slope over each level). Another benefit is that MLM uses pairwise deletion, keeping data for subjects who only have one data point (e.g., only pre-treatment data and no post-treatment data).

Linear Mixed-Effect models are an extension of linear regression. The equation for a simple regression is $Y_i = \beta_0 + \beta_1 X_i + r_i$. In this equation Y_i is the value for the dependent variable for participant "i," β_0 is the value of the Y intercept, β_1 is the slope, X_i is the independent variable for participant "i," and r_i is the error in prediction. Usually in a regression equation the values of β_0 and β_1 are fixed (same parameters apply to each case; Kahn, 2011). However, in MLM because there are nested data, it is likely that the parameters vary due to group membership or provider characteristics (see Figure 3). In the current study, Level 1 data of MLM there is a fixed intercept and slope that will apply to the whole sample. When Level 2 variables are taken into account (i.e., individual characteristics) the intercepts and slopes may vary. Similar to simple regression equations, in MLM the variable Y is the outcome variable whereas X is the predictive variable. In the following equation "i" stands for the within-subjects Level 1 variable (i.e., time), "j" stands for the Level 2 variable (i.e., individual characteristics), and "k" stands for the Level 3 variables (i.e., provider characteristics). Each model has a unique error term to allow for random variation (i.e., r, u, v). None of the moderators were centered because there were no significant interactions that would require centering (i.e., such as for the variable of age). Specific equations

for each model are reviewed later in the chapter with the results of each model. The following is

an example of the equations used in a three-level multi-modeling analysis:

Figure 3.

General and Specific Multilevel Model Equations for Current Study

General Equation	**Example of Specific Equation**

Level 1 Model (within subjects variables)   Level 1 or i: Time

$$Y_{ijk} = \beta_{0jk} + \beta_{1jk}X_{ijk} + r_{ijk}$$ $$\text{PCL-M}_{ijk} = \beta_{0jk} + \beta_{1jk}\text{Time}_{ijk} + r_{ijk}$$

Level 2 Model (between subjects variables)   Level 2 or j: Individual characteristics

$$\beta_{0jk} = \gamma_{00k} + u_{0jk}$$ $$\beta_{0jk} = \gamma_{00k} + \gamma_{0jk}\text{Moderator}_j + u_{0jk}$$

$$\beta_{1jk} = \gamma_{10k} + u_{1jk}$$ $$\beta_{1jk} = \gamma_{10k} + \gamma_{1jk}\text{Moderator}_j + u_{1jk}$$

Level 3 Model (between subjects variables)   Level 3 or k: Providers

$$\gamma_{00k} = \delta_{000} + \delta_{001}X_k + v_{0k}$$ $$\gamma_{00k} = \delta_{000} + v_{0k}$$

$$\gamma_{10k} = \delta_{100} + \delta_{101}X_k + v_{1k}$$ $$\gamma_{10k} = \delta_{100} + v_{1k}$$

Figure 3. Examples of individual characteristics include race, age, and mental health diagnosis. Examples of provider-level characteristics include age, degree, and years of experience.

A series of multilevel models were run to test hypotheses 3 and 4, as well as the research

question. The first step was to determine the variance decomposition, which used a 4-level MLM

with random intercepts at time, person, group, and provider. Each of the next four models built

upon each other. The first model assessed whether variance in PCL-M total scores (PTSD

symptomology) was due to variation over time within person, over persons, over groups, or over

providers. Model 1 also compared results both including and excluding the group level to

determine best model fit. Model 2 did not include group due to the small variance accounted for

in that level (see results in Table 17). Model 2 estimated an intercept and fixed linear slope over

time (i.e., pre-, post-treatment) nested within person, and within provider. This model allowed for the assessment of whether there were significant changes in PCL-M total scores over time. Model 3 allowed the fixed linear slope to vary as a function of person. This model allowed for the assessment of whether veterans differed in their improvement (of PCL-M total scores) over time due to individual characteristics (e.g., race, education). Model 4 allowed the fixed linear slope to vary as a function of person and as a function of provider (i.e., measuring whether providers' effectiveness differed from each other). This allowed for the assessment of whether there was a difference in the effect of providers on PCL-M total scores over time. Finally, cross-level moderation was tested by adding potential moderating variables as main effects and cross-level interactions to predict intercept and linear slope in PCL-M total scores.

Results

Preliminary Data Screening

Prior to running the main statistical analyses, the data were checked for errors, missing values, and univariate outliers.

Missing data. Missing data on the PCL-M were evaluated. Data from participants with more than 20% of their responses missing from the scale (i.e., fewer than 14 items answered) were excluded from further analyses (Tabachnick & Fidell, 2007). Similar procedures were used to handle missing data on each subscale of the PCL-M, in that data from participants with more than 20% of their responses missing from a subscale/symptom cluster were not used for the analysis of that subscale (Tabachnick & Fidell, 2007). If a participant had missing data for fewer than 20% of the items on a subscale, then a subscale score was derived by using a computed mean score based on the completed items on that scale.

A total of 450 individuals were included in the analyses. Thirty-seven participants had missing PCL-M total scores at intake. Because PCL-M data at intake were extracted from chart review and were assessed regularly during the intake session, this variable had the lowest frequency of missing data. One hundred participants had missing PCL-M total scores at pre-treatment and 164 individuals had missing PCL-M total scores at post-treatment. Missing data were often the result of the therapy provider failing to submit data for the program evaluation. However, missing data were also due to participants' attendance (i.e., not attending session 1 or 10) or if a participant attended the session but did not provide self-report data. Five groups had missing data for the pre-treatment session (three groups with Provider 1, one group with Provider 6, and one group with Provider 7). Six groups had missing data from the post-treatment session (two groups with Provider 1, three groups with Provider 3, one group with Provider 7).

Analyses were conducted to determine whether there were significant differences between participants who provided both pre- and post-treatment data and those with missing data. For participants with and without complete data there were no statistically significant differences in terms of participant age ($p = .06$), educational status ($p = .45$), highest rank ($p = .21$), total service connection ($p = .39$), PTSD service connection (.36), and PCL-M score at intake (.52). Not surprisingly, veterans with complete data attended significantly more sessions ($M = 8.86$) compared with individuals without complete data ($M = 6.25$), $t(448) = -11.75$, $p < .001$.

Chi-square tests revealed no significant differences in race, $\chi(1) = .52$, $p = .47$, marital status $\chi(4) = 3.25$, $p = .52$, $p = .076$, branch of service $\chi(4) = 2.14$, $p = .71$, era of service $\chi(5) = 9.96$, anxiety disorder diagnosis $\chi(1) = 1.50$, $p = .22$, mood disorder diagnosis $\chi(1) = .44$, substance use diagnosis $\chi(1) = .02$, $p = .89$, $p = .51$, cognitive disorder diagnosis $\chi(1) = .02$, $p =$

.88, or history of child abuse $\chi(1) = 2.67$, $p = .10$. There was a significant difference between participants with and without complete data in terms of employment status, $\chi(2) = 6.08$, $p < .05$. More participants who were unemployed had complete data (10.9%) than incomplete data (9.6%). More participants who were pensioner/disabled/retired/unstable employment had complete data (60.9%) than incomplete data (51.0%). In contrast, more participants with stable employment had incomplete data (39.4%) than complete data (28.2%).

Assumption checking. The following assumptions of ANOVAs were checked prior to conducting the main analyses: normally distributed residuals of the dependent variables, univariate and multivariate outliers, and homogeneity of variance. Additionally, assumptions for the ANCOVAs and MANCOVAs were checked prior to running the main analyses: homogeneity of regression slopes, homoscedasticity, and a linear relationship between covariates and dependent variables at each level of the independent variable. Additionally, assumptions of MLM were assessed prior to running analyses: linearity, normality, homoscedasticity, and independence of observations. There were no issues with any of the assumptions.

Preliminary Analyses

Descriptive statistics. Descriptive statistics for the PCL-M are presented in Table 7. Means, standard deviations, and ranges for PCL-M total scores and the four symptom cluster scores at each time point are presented based on participants' race and for the overall sample. In the total sample the mean PCL-M total score was 61.70 ($SD = 11.51$) at intake, 63.02 ($SD = 11.29$) at pre-treatment, and 55.89 ($SD = 12.88$) at post-treatment. The effect size for the PCL-M change between pre- and post-treatment for the total sample was $d = .64$, suggesting a medium effect (Cohen, 1988). In the subsamples of non-Hispanic African American and Caucasian veterans, the effect sizes for the PCL-M change between pre- and post-treatment were $d = .63$

and $d = .80$ respectively, suggesting a medium and large effect (Cohen, 1988). Furthermore, Table 8 illustrates the frequencies and percentages of participants with scores both above and below the PCL-M cut-off score of 55, which the McGuire VAMC uses to help determine PTSD diagnosis. Overall, roughly 68% of participants were at or above a score of 55 at intake, compared with 60% at pre-treatment and 37% at post-treatment. Table 9 outlines different categories of change in PCL-M scores from pre- to post-treatment. Of those veterans who provided pre- and post-test data (50%), roughly 13% of participants showed a worsening of symptoms, 2% showed no change, 7% showed an improvement of less than 5 points, 9% showed an improvement of at least 5 points (indicating a response to treatment) but less than 10 points, and 20% showed an improvement of 10 or more points (indicating clinically significant improvement).

Table 7

Means and Standard Deviations for Intake, Pre-Treatment, and Post-Treatment of Posttraumatic Stress Disorder Checklist-Military Version (PCL-M)

	Non-Hispanic African American		Non-Hispanic Caucasian		Total Sample			
	M	*SD*	*M*	*SD*	*M*	*SD*	Sample Range	Possible Range
Intake								
Total Score	62.25	12.07	60.79	10.50	61.70	11.51	28-85	0-85.00
Re-experiencing	17.89	4.19	16.67	4.03	17.43	4.17	5-25	0-25.00
Avoidance	7.54	1.89	7.63	1.88	7.58	1.89	2-10	0-10.00
Numbing	16.89	4.47	16.59	4.29	16.78	4.40	5-25	0-25.00
Hyperarousal	19.93	4.09	19.90	3.46	19.91	3.86	7-25	0-25.00
Pre-treatment								
Total Score	63.26	11.66	62.65	10.72	63.02	11.29	17-85	0-85.00
Re-experiencing	17.97	4.08	17.28	3.78	17.70	3.98	5-25	0-25.00
Avoidance	7.97	4.08	7.62	1.82	7.50	1.83	2-10	0-10.00
Numbing	17.80	4.31	17.77	4.42	17.79	4.35	5-25	0-25.00
Hyperarousal	20.01	3.59	20.00	3.35	20.00	3.50	5-25	0-25.00
Post-treatment								
Total Score	56.86	12.94	54.30	12.68	55.89	12.88	21-85	0-85.00
Re-experiencing	16.43	4.21	15.65	4.07	16.14	4.16	6-25	0-25.00
Avoidance	6.79	2.04	6.43	1.93	6.65	2.00	2-10	0-10.00
Numbing	16.00	4.36	15.17	4.60	15.69	4.46	5-25	0-25.00
Hyperarousal	17.65	4.35	17.10	4.25	17.44	4.31	5-25	0-25.00

Note. Factor model from Maestas, Benge, Pastorek, LeMaire, & Darrow, 2011. Symptom clusters are divided as follows: re-experiencing (items 1-5), avoidance (items 6-7), numbing (items 8-12), and hyperarousal (items 13-17).

Table 8

Frequency of Posttraumatic Stress Disorder Checklist-Military Version (PCL-M) Total Scores Based on McGuire PTSD Cut-off Score for Posttraumatic Stress Disorder

	Non-Hispanic African American PCL-M Total Score *n* (%)		Non-Hispanic Caucasian PCL-M Total Score *n* (%)		Total Sample PCL-M Total Score *N* (%)	
	< 55	≥ 55	< 55	≥ 55	< 55	≥ 55
Intake	65 (23.4)	192 (69.1)	41 (23.8)	115 (66.9)	106 (23.6)	307 (68.2)
Pre-treatment	46 (16.5)	167 (60.1)	35 (20.3)	102 (59.3)	81 (18.0)	269 (59.8)
Post-treatment	66 (23.7)	112 (40.3)	52 (30.2)	56 (32.6)	118 (26.2)	168 (37.3)

Note. PCL-M = Posttraumatic Stress Disorder Checklist-Military Version.

Table 9

Change in Posttraumatic Stress Disorder Checklist-Military Version (PCL-M) Total Scores from Pre-Treatment to Post-Treatment

	Non-Hispanic African American		Non-Hispanic Caucasian		Total Sample	
PCL-M change score	*n*	(%)	*n*	(%)	*N*	(%)
< 0	41	(14.7)	18	(10.5)	59	(13.1)
0	3	(1.1)	4	(2.3)	7	(1.6)
> 0, <5	21	(7.6)	12	(7.0)	33	(7.3)
≥ 5, < 10	22	(7.9)	20	(11.6)	42	(9.3)
≥ 10	52	(18.7)	38	(22.1)	90	(20.0)
Missing data	139	(50.0)	80	(46.5)	219	(48.7)

Note. The Department of Veterans Affairs suggests that a 5-point decrease indicates that an individual has responded to treatment, while a 10-point decrease indicates clinically significant change (U.S. Department of Veteran Affairs, 2012).

Internal consistency was estimated using Cronbach's alpha for the PCL-M at each of the three time points and by racial group (Table 10). The Cronbach's alpha for the PCL-M total score ranged from .86 to .93, suggesting the scale had good reliability for both non-Hispanic

African American and non-Hispanic Caucasian veterans. For the 5-item subscale of re-experiencing, Cronbach's alpha ranged from .82 to .88. For the 2-item subscale of avoidance, Cronbach's alpha ranged from.70 to .80. For the 5-item subscale of numbing, Cronbach's alpha ranged from .70 to .84. Last, for the 5-item subscale of hyperarousal, Cronbach's alpha ranged from .71 to .86.

Table 10

Internal Consistency Reliability Estimates for Posttraumatic Stress Disorder Checklist-Military Version (PCL-M)

Time Point	Non-Hispanic African American	Non-Hispanic Caucasian	Total Sample
Intake			
Total	.90	.86	.89
Re-experiencing	.83	.82	.83
Avoidance	.74	.71	.73
Numbing	.72	.70	.71
Hyperarousal	.80	.71	.77
Pre-treatment			
Total	.91	.89	.91
Re-experiencing	.86	.84	.85
Avoidance	.80	.70	.76
Numbing	.77	.80	.78
Hyperarousal	.81	.74	.78
Post-treatment			
Total	.93	.93	.93
Re-experiencing	.88	.86	.88
Avoidance	.80	.76	.79
Numbing	.81	.84	.82
Hyperarousal	.86	.82	.85

Note. Analyses were based on a four-factor model (Maestas et al., 2011) with the symptom clusters of Re-experiencing (Items 1-5), Avoidance (Items 6-7), Numbing (8-12), and Hyperarousal (Items 13-17).

There were a total of 52 groups; however, one group was all female and thus excluded from analyses. Another group had no pre- or post- treatment data submitted; however, data for these veterans at intake were used. Group membership ranged from 3 to 14 veterans ($M = 10.02$, $SD =$

2.35), with most groups ranging between 7 and 14 members (See Table 11). Racial composition

of each group was calculated with a percentage, by using the demographic information from

every individual who attended at least one session in the group. Three different group

composition values were calculated: percentage Non-Hispanic Caucasian, percentage Non-

Hispanic African American, and percentage racial/ethnic minorities (See Table 12). Due to a few

veterans declining to answer questions about their race or ethnicity, one group had a total racial

composition that did not add up to 100%. Groups had a relatively high percentage of non-

Hispanic African American Veterans ($M = 60.09\%$, $SD = 16.93\%$). Thus, an even larger

percentage of the groups consisted of racial and ethnic minority Veterans ($M = 66.74\%$, SD

$=17.16\%$). There were no groups with a composition of less than 20% racial or ethnic minority

members, nor were there any groups with 100% non-Hispanic Caucasian veterans. For a detailed

table listing the total number of group members for each group and a breakdown of racial

composition of each group see Appendix E.

Table 11

Group Member Frequencies

Number of Members in Group	Frequency of Groups ($N = 50$)
3	1
4	0
5	1
6	1
7	4
8	3
9	11
10	7
11	9
12	6
13	3
14	4

Table 12

Group Racial and Ethnic Composition Frequencies

	Number of Groups		
Percentage of a Group	Non-Hispanic Caucasians	Non-Hispanic African Americans	Racial/Ethnic Minorities
0-5	2	0	0
6-10	1	0	0
11-15	2	0	0
16-20	7	0	0
21-25	8	1	1
26-30	6	1	0
31-35	4	0	0
36-40	3	5	2
41-45	4	5	2
46-50	5	5	7
51-55	3	1	1
56-60	3	8	5
61-65	1	5	2
66-70	0	6	7
71-75	0	6	8
76-80	1	3	6
81-85	0	1	4
86-90	0	1	2
91-95	0	0	1
96-100	0	2	2

Additional descriptive analyses (e.g., frequencies, means, and standard deviations) were conducted for session attendance and dropout rates for non-Hispanic African American and non-Hispanic Caucasian Veterans (Table 13). Roughly a third of all veterans dropped out of the group therapy (attended less than eight sessions); the average number of sessions attended was 7.59 ($SD = 2.65$). The time between intake and pre-treatment about 5.5 months or 163.26 days ($SD = 339.60$). For all veterans, the number of sessions attended was not significantly correlated with PCL-M total score at pre-treatment $r(350) = .01$, $p = .80$, total service connection $r(414) = -.04$, $p = .39$, or PTSD service connection $r(441) = -.04$, $p = .46$.

Table 13

Group Therapy Variables

	Non-Hispanic African American (*n* = 278, 61.8%)		Non-Hispanic Caucasian (*n* = 172, 38.2%)		Total Sample (*N* = 450, 100%)	
	M	*SD*	*M*	*SD*	*M*	*SD*
Sessions attended	7.47	(2.73)	7.79	(2.52)	7.59	(2.65)
Days between intake and pre-treatment	165.57	(340.91)	159.56	(338.48)	163.26	(339.60)
	n	(%)	*n*	(%)	*N*	(%)
Session attendance						
Less than 8	94	(33.80)	54	(31.40)	148	(32.90)
Less than 7	69	(24.80)	36	(20.90)	105	(23.30)
Less than 6	49	(17.60)	25	(14.50)	74	(16.40)

Covariates. Based on prior research, the current study examined the following variables to assess whether they were covariates of PTSD symptom severity at intake: age, marital status, employment status, education, branch of service, highest enlisted military rank, period of service, anxiety disorder diagnosis, mood disorder diagnosis, and substance use disorder diagnosis. In addition, exploratory analyses were conducted to test whether the following variables covaried with the intake PTSD scores: era of service and percent service connected for PTSD. Correlations were used to examine continuous variables, *t* tests were used for dichotomous variables with two groups, and ANOVAs were conducted to assess categorical variables with more than two groups.

The association between continuous variables and PCL-M total score at intake was assessed through bivariate correlations (see Table 14). Veterans' age was negatively correlated with intake PCL-M total scores (*r* = -.16), suggesting that younger veterans in this sample had higher PTSD symptom severity. Unsurprisingly, the percentage of PTSD service connection was

also mildly positively correlated with PCL-M total scores ($r = .16$). Total service connection,

education, and highest enlisted rank were not significantly associated with PCL-M total score at

intake.

Table 14

Covariate Testing: Correlations Among Posttraumatic Stress Disorder Checklist-Military Version (PCL-M) Scores

Instrument	1	2	3	4	5	6
1. Intake PCL-M total score	--					
2. Age	-.16**	--				
3. Total service connection	.08	-.04	--			
4. PTSD service connection	.16**	.00	.46**	--		
5. Education	-.01	-.11	.08	-.03	--	
6. Highest enlisted rank	.04	-.02	.14**	.07	.41**	--

Note. PCL-M = Posttraumatic Stress Disorder Checklist- Military Version; PTSD = Posttraumatic Stress Disorder.
*$p < .05$. **$p < .01$.

Associations between dichotomous variables with two groups and the PCL-M total score

at intake were assessed using a series of *t* tests. There was a statistically significant difference in

PCL-M total scores at intake between individuals with and without anxiety disorder diagnoses,

$t(409) = 2.03$, $p = .04$. Individuals without anxiety disorders had higher PCL-M total scores at

intake ($M = 62.14$, $SD = 11.67$) compared to veterans with anxiety disorders ($M = 58.68$, $SD =$

10.10). There was a statistically significant difference in PCL-M total scores at intake between

individuals with and without mood disorder diagnoses, $t(401) = -3.33$, $p = .001$. Individuals with

a mood disorder had higher PCL-M total scores at intake ($M = 63.11$, $SD = 11.38$) compared to

veterans without mood disorders ($M = 59.25$, $SD = 11.34$). Furthermore, there was a statistically

significant difference in PCL-M total scores at intake between individuals with and without

substance use disorders, $t(407) = -2.21$, $p = .03$. Individuals with a substance use disorder had

higher PCL-M total scores at intake ($M = 63.34$, $SD = 11.29$) compared to veterans without

substance use disorders ($M = 60.75$, $SD = 11.56$). There were no statistically significant

differences found in PCL-M total scores at intake between individuals with and without

cognitive disorder diagnoses, $t(410) = -1.47$, $p = .14$ or for individuals with and without

personality disorders, , $t(411) = .12$, $p = .90$.

A series of ANOVAs were conducted to assess which categorical variables with more

than two groups covaried with PTSD symptomology at intake. There were significantly different

PCL-M total scores at intake based on veterans' marital status, $F(4, 402) = 3.45$, $p = .01$. The

results from Tukey HSD post-hoc analyses showed that widowed veterans had significantly

lower PCL-M total scores at intake ($M = 51.45$, $SD = 10.41$) compared to those who were

married ($M = 61.26$, $SD = 11.64$), separated ($M = 65.38$, $SD = 8.59$), divorced ($M = 63.64$, $SD = 11.25$), or never married ($M = 63.49$, $SD = 10.23$). As stated previously, medical charts only

listed one period of service for each veteran. Three veteran reported serving in each of the

following wars: the Korean War ($n = 1$), WWII ($n = 1$), and post Korean War ($n = 1$). Thus,

these three individuals were not included in analyses to examine period of service as a covariate

due to low frequencies for those eras of service. There were significantly different PCL-M total

scores at intake based on veterans' period of service, $F(2, 407) = 10.33$, $p < .001$. The results

from Tukey HSD post-hoc analyses showed that Vietnam Era veterans had significantly lower

PCL-M total scores at intake ($M = 59.07$, $SD = 11.89$) compared to Post-Vietnam ($M = 65.36$, $SD = 11.50$) and Persian Gulf veterans ($M = 63.79$, $SD = 10.40$).

Correlations. Bivariate analyses were conducted to assess correlations between pre- and

post-treatment PCL-M scores for both total symptom and cluster symptom scores (Table 15). All

bivariate correlations were significant at the $p < .01$ level. The correlations ranged from .35 to

.89. The following are pre- and post-treatment correlations for the PCL-M: total scores ($r = .64$),

re-experiencing ($r = .63$), avoidance ($r = .48$), numbing ($r = .57$), and hyperarousal ($r = .56$).

Table 15

Correlations Among Posttraumatic Stress Disorder Checklist-Military Version (PCL-M)
Scores at Pre- and Post- Treatment

Instrument	1	2	3	4	5	6	7	8	9	10
Pre-treatment										
1. Total	--									
2. Re-experiencing	.82	--								
3. Avoidance	.73	.61	--							
4. Numbing	.86	.49	.52	--						
5. Hyperarousal	.85	.56	.50	.68	--					
Post-treatment										
6. Total	**.64**	.57	.46	.51	.56	--				
7. Re-experiencing	.57	**.63**	.43	.38	.44	.87	--			
8. Avoidance	.48	.43	**.48**	.35	.39	.76	.64	--		
9. Numbing	.57	.40	.39	**.57**	.50	.88	.62	.59	--	
10. Hyperarousal	.56	.49	.35	.44	**.56**	.89	.68	.58	.71	--

Note. All correlations were significant at $p < .01$.

Bivariate correlations were conducted to examine whether the racial composition of the

groups was associated with the number of sessions attended. The sample was split by race, such

that correlations were conducted separately for non-Hispanic Caucasian and non-Hispanic

African American veterans. For non-Hispanic Caucasian veterans, both the percentage of non-

Hispanic African Americans in the group and the percentage of racial or ethnic minorities in the

group were significantly associated with the total number of sessions attended ($r = -.18$, $p = .02$;

$r = -.21$, $p = .01$). Thus, the more racial or ethnic minority members in the group, the fewer group sessions non-Hispanic Caucasian veterans attended. In the sample of non-Hispanic African American veterans, none of the correlations regarding racial/ethnic group composition were significant. Specifically, for non-Hispanic African American veterans, the percentage of non-Hispanic African Americans in the group and the percentage of racial or ethnic minorities in the group were not significantly associated with the total number of sessions attended ($r = -.04$, $p = .53$; $r = -.04$, $p = .47$). Additionally, for all veterans, session attendance was positively associated with age of the veteran, $r = .31$, $p < .001$, but was not associated with the veteran's education level ($p = .94$) or with years of experience of the provider ($p = .11$).

Hypothesis Testing

Hypothesis 1 was tested with an analysis of covariance (ANCOVA) and Hypothesis 2 with a multivariate analysis of covariance (MANCOVA). Hypotheses 3, 4, and 5, as well as the research question, were tested using Linear Mixed Modeling (Multilevel Modeling; MLM) analyses.

Hypothesis 1. Non-Hispanic African American male veterans will report more severe PTSD symptoms (higher PCL-M total scores) at intake compared to non-Hispanic Caucasian male veterans, after controlling for significant covariates.

Analysis of Hypothesis 1. An analysis of covariance (ANCOVA) was conducted to evaluate whether there was a significant difference in PTSD scores based on race (Caucasian/African American). Race served as the independent variable, total PCL-M symptom scores at intake served as the dependent variable. The following covariates were included in the analysis: age, marital status, period of service, anxiety disorder diagnosis, mood disorder diagnosis, and substance use disorder diagnosis. The unadjusted mean for the total PCL-M

symptom score for non-Hispanic Caucasian veterans was $M = 61.00$ ($SD = 10.56$) and for non-Hispanic African American veterans was $M = 62.08$ ($SD = 11.90$). After taking covariates into account, the adjusted mean for the total PCL-M symptom score for non-Hispanic Caucasian veterans was $M = 61.44$ ($SE = .91$) and for non-Hispanic African American veterans was $M = 61.81$ ($SE = .70$). After accounting for the covariates, there was not a statistically significant difference in total PCL-M symptom scores at intake based on veterans' race, $F(1, 381) = .10$, $p = .75$, $\eta^2 < .001$.

Hypothesis 2. Non-Hispanic African American male veterans will report more severe PTSD symptoms (higher PCL-M scores) for the symptom cluster of hyperarousal (i.e., Cluster D in DSM-IV) at intake compared to non-Hispanic Caucasian male veterans, after controlling for significant covariates.

Analysis of Hypothesis 2. A multivariate analysis of covariance (MANCOVA) was conducted to evaluate whether there was a significant difference in PTSD symptom cluster scores at intake based on race (Caucasian/African American). Race served as the independent variable, PCL-M symptom cluster scores (i.e., re-experiencing, avoidance, numbing, and hyperarousal) served as the dependent variables. The following covariates were included in the analysis: age, marital status, period of service, anxiety disorder diagnosis, mood disorder diagnosis, and substance use disorder diagnosis.

Box's test of equality of covariance matrices was used for the homogeneity of variance-covariances matrices ($p = .15$). There was homogeneity of variances, as assessed by the Levene's Test of Homogeneity of Variance, for the symptom clusters of Re-Experiencing, Avoidance, and Numbing ($p > .05$), but not for Hyperarousal ($p = .02$). Thus, because the variances for the two racial groups was not equal for Hyperarousal, a non-parametric test was chosen to assess

statistical differences between groups. A Mann-Whitney U test was run to determine whether there were differences in Hyperarousal scores between non-Hispanic African Americans and Caucasians. Distributions of the Hyperarousal scores for each racial group were similar, as assessed by visual inspection. The median Hyperarousal score was not statistically significantly different between non-Hispanic African American and Caucasian veterans, $U = 19,365.50$, $z = -.58$, $p = .56$.

After controlling for covariates, the overall MANOVA was statistically significant, $F(4, 378) = 3.78$, $p = .01$; Wilks' $\Lambda = .96$; partial η2 $= .04$. There was a statistically significant difference in re-experiencing symptom scores at intake between non-Hispanic Caucasian and non-Hispanic African American veterans, $F(1, 381) = 4.88$, $p = .03$; partial $\eta^2 = .01$. Non-Hispanic African American veterans (Adjusted $M = 17.79$, $SE = .26$) had higher scores on re-experiencing compared to non-Hispanic Caucasians (Adjusted $M = 16.82$, $SE = .34$). There were no statistically significant differences at intake in the symptom clusters of avoidance (partial $\eta^2 < .01$, $p = .20$), numbing ($\eta^2 < .01$, $p = .99$), or hyperarousal ($\eta^2 < .01$, $p = .39$). Adjusted means for the symptom clusters are listed in Table 16.

Table 16

MANOVA Results for Posttraumatic Stress Disorder Checklist-Military Version (PCL-M) Symptom Cluster Scores at Intake

	Non-Hispanic African American		Non-Hispanic Caucasian		Between subjects		
	Adjusted *M*	*SE*	Adjusted *M*	*SE*	$F(1, 381)$	*p*	Partial η^2
Re-experiencing	17.79	.26	16.82	.34	4.882	.028*	.013
Avoidance	7.50	.12	7.75	.15	1.635	.202	.004
Numbing	16.74	.27	16.74	.35	.000	.989	.000
Hyperarousal	19.79	.24	20.13	.31	.740	.390	.002

Note. Adjusted for age, marital status, period of service, anxiety disorder diagnosis, mood disorder diagnosis, and substance use diagnosis.
*$p < .05$.

Hypothesis 3. The PTSD Recovery Program will be effective (i.e., significant reduction in overall PTSD severity) for non-Hispanic Caucasian Veterans.

Hypothesis 4. The PTSD Recovery Program will be effective (i.e., significant reduction in overall PTSD severity) for non-Hispanic African American Veterans.

Research Question: Is the racial composition of therapy groups associated with treatment outcomes (e.g., PTSD symptom reduction or session attendance)?

Analysis of Hypothesis 3 & 4, and the Research Question: Linear Mixed Modeling was conducted to determine whether the PTSD Recovery Program was effective in reducing overall PTSD symptom severity for non-Hispanic African American veterans and non-Hispanic Caucasian veterans. Potential moderation of treatment efficacy was evaluated by developing a model which best described the data and then adding potential moderating variables as main effects and cross-level moderators of person's slope (i.e., the extent to which a participant

improved). A series of models were run to assess for a best-fitting model. Four multilevel models were run to test the third and fourth hypotheses, in addition to the research question. The first model followed up on variance decomposition results to assess whether model fit improved when removing nesting of persons within group: variance in PCL-M total score at intercept was modeled as nested within persons within providers with a random intercept fit for persons and providers. Model 2 examined change in PCL-M total score over treatment by estimating an intercept and fixed linear slope over time with random intercepts for person and provider. Model 3 added a random effect for linear slope over persons to evaluate whether the linear slope over time varied over persons. Model 4 added a random effect for linear slope over providers to evaluate whether the linear slope over time also varied based on providers. Racial composition of groups and minority composition of groups were tested as potential moderators of treatment effectiveness. Due to the large amount of missing data, the MLM analyses were re-run with only participants who had both pre- and post-treatment data to determine if there would be different outcomes. Results were found to be unchanged. In review of those results and given that MLM is designed to handle missing data, the results reported below incorporate data from the total sample of 450 veterans.

Variance Decomposition: Intraclass correlations coefficients (ICCs) for of each of the four levels were calculated to determine the best-fitting model for the data. ICCs indicated that 43.10% of the variance was due to person, 1.02% was due to the group, and 4.06% was due to the provider. The remaining 51.83% of variance was due to changes in symptoms within person (e.g., variance from pre- to post-treatment) and describes changes in symptoms over the course of treatment. Results of the variance decomposition analysis indicate that variance in symptomatology was largely due to variability over time, over persons, and over providers. The

small amount of variance between groups suggests that groups were homogenous and exchangeable with regard to average symptomatology and change over treatment. For this reason, nesting within groups was removed from Models 2 through 4.

Model 1: Given the results from the ICC (low variance in groups), I wanted to assess model fit with and without Level 3 data (i.e., therapy groups). Linear Mixed Modeling was used to assess a four-level model (Model 1a) including therapy groups as well as a three-level model (Model 1b) without therapy groups. Results in Table 17 show that there was no significant difference in the model (Model 1b, BIC = 4967.53) after removing the level of therapy groups (Model 1a, BIC = 4973.77).

Table 17

Model Fit Indices Comparing Models 1a and 1b

	df	AIC	BIC	-2LL	L Ratio	*p*
Model 1a	5	4951.50	4973.77	-2470.75		
Model 1b	4	4949.72	4967.53	-2470.86	.22	.64

Note. AIC = Akaike Information Criterion, BIC = Bayesian Information Criterion, L Ratio = Likelihood Ratio, and LL = Log-likelihood.

Model 1b (see Table 18) included a fixed effect intercept of PCL-M total scores (Level 1 data) and random effects intercept at the level of person (Level 2 data) and provider (Level 3 data). The results from Model 1b indicated that the there was significant variance in PCL-M total scores at intercept, in that they were significantly different from zero, $B = 60.24$, 95% CI [58.20, 62.27], $p < .001$. There was also heterogeneity among people and providers. The random effects resulted in the following standard deviations in PCL-M total scores based on providers, $\sigma = 2.60$,

95% CI [1.24, 5.47] and for veterans, σ = 8.28, 95% CI [7.23, 9.48]. The equation for model 1b

is:

$$\text{PCL-M}_{ijk} = ((\delta_{000} + v_{0k}) + u_{0jk}) + r_{ijk}$$

Table 18

Multilevel Model 1b

	Estimate (B)	*SE*	*df*	*t* Value	Lower	Upper	*p*
Fixed effects							
PCL-M intercept	60.24***	1.03	394	58.24	58.20	62.27	<.001
Random effects	(σ)						
Provider intercept	2.60	-	-	-	1.24	5.47	-
Person intercept	8.28	-	-	-	7.23	9.48	-

***p < .001.

Model 2: This model added to Model 1b by including time within person using a fixed

slope (Table 19). There was a significant effect (cross-level interaction) of time within person for

the PCL-M slope, B = -7.21, 95% CI [-8.49, -5.92], p <.001. The mean change of PCL-M total

scores over time for all veterans was -7.21. Thus, veterans' PCL-M total scores significantly

improved (decreased) from pre-treatment to post-treatment by about 7 points. Similar to the last

model, there was significant variance in PCL-M total scores at pre-treatment, in that the value

was significantly different from zero, B = 63.42, 95% CI [61.34, 65.49], p <.001. There

continued to be heterogeneity among people and providers. The random effects resulted in the

following standard deviations in PCL-M total scores based on providers, σ = 2.55, 95% CI [1.24,

5.28] and for veterans, σ = 8.94, 95% CI [8.02, 9.95]. The equation for Model 2 is:

$$\text{PCL-M}_{ijk} = ((\delta_{000} + v_{0k}) + u_{0jk}) + \delta_{100}\text{Time}_{ijk} + r_{ijk}$$

Table 19

Multilevel Model 2

	Estimate (B)	SE	df	t Value	Lower	Upper	p
Fixed effects							
PCL-M intercept	63.42***	1.06	394	60.08	61.34	65.49	<.001
Time (slope)	-7.21***	.65	230	-11.05	-8.49	-5.92	<.001
Random effects	(σ)						
Provider intercept	2.55	-	-	-	1.24	5.28	-
Person intercept	8.94	-	-	-	8.02	9.95	-

***$p < .001$.

Model 3: This model added to the previous model by including the random effect of time (slope) due to person; a Level 2-Level 1 cross-level interaction (Table 20). Adding the random effect of time allowed for an assessment of whether veterans differ in their improvement (of PCL-M total scores) over time due to individual characteristics (e.g., race, education). There was a cross-level interaction for Level 2 (person) and Level 1 (time) variables. The standard deviation showed variance in people over time (slope), $\sigma = 9.13$, 95% CI [0.00, 1.75e4], suggesting that veterans differ from each other in their improvement in PCL-M total scores over time. These differences in slope indicated that veterans with higher PCL-M total scores at pre-treatment had more significant decreases in PCL-M total scores over time compared to veterans with lower pre-treatment scores. Similar to the last model, there was significant variance in PCL-M total scores, in that they were significantly different from zero, $B = 63.31$, 95% CI [61.41, 65.22], $p < .001$. There continued to be a significant effect of time within person for the PCL-M slope, $B = -7.22$, 95% CI [-8.52, -5.92], $p < .001$. The random effects resulted in the following standard deviations in PCL-M total scores based on providers, $\sigma = 2.26$, 95% CI [1.03, 4.94] and for veterans $\sigma = 10.45$, 95% CI [.58, 188.04]. The equation for Model 3 is:

$$\text{PCL-M}_{ijk} \ ((\delta_{000} + v_{0k}) + u_{0jk}) + (\delta_{100} + u_{1jk})\text{Time}_{ijk} + r_{ijk}$$

Table 20

Multilevel Model 3

	Estimate (*B*)	*SE*	*df*	*t* Value	Lower	Upper	*p*
Fixed effects							
PCL-M intercept	63.31***	.97	394	65.45	61.41	65.22	<.001
Time (slope)	-7.22***	.66	230	-10.96	-8.52	-5.92	<.001
Random effects	(σ)						
Provider intercept	2.26	-	-	-	1.03	4.94	-
Person intercept	10.45	-	-	-	.58	188.04	-
L2-L1 cross-level							
Interaction (slope)	9.13	-	-	-	<.01	1.75e4	-

Note. L2 = Level 2 (person); L1 = Level 1 (time); e = times ten raised to the power of *x*.
***p* < .001.

Model 4: This model added in the random effect time (slope) due to provider; assessing whether there was a difference in the effect of providers on PCL-M total scores over time; a Level 3- Level 1 cross-level interaction (Table 21 and Figure 4). There was a cross-level interaction for Level 3 (providers) and Level 1 (time) variables. The slope for providers varied over time, σ = 2.52, CI [1.11, 5.70], indicating that providers differ from each other in how much they affect PCL-M total score reduction. There continued to be a cross-level interaction for Level 2 (person) and Level 1 (time) variables. There was variance in people over time (slope), σ = 9.03, 95% CI [3.33, 24.47], suggesting that veterans differ from each other in their improvement in PCL-M total scores over time. Veterans continued to show a reduction in PCL-M total scores over time, *B* = -6.41, CI [-8.47, -4.36], *p* <.001 and PCL-M total scores significantly differed from zero, *B* = 63.36, 95% CI [61.78, 64.94], *p* <.001. Furthermore, the random effects resulted

in the following standard deviations in PCL-M total scores based on providers, $\sigma = 1.66$, 95% CI

[.63, 4.36] and for veterans $\sigma = 10.53$, 95% CI [7.27, 15.23]. The equation for Model 4 is:

$$\text{PCL-M}_{ijk} = ((\delta_{000} + v_{0k}) + u_{0jk}) + ((\delta_{100} + v_{1k}) + u_{1jk})\text{Time}_{ijk} + r_{ijk}$$

Table 21

Multilevel Model 4

	Estimate (*B*)	*SE*	*df*	*t* Value	Lower	Upper	*p*
Fixed Effects							
PCL-M intercept	63.36***	.80	394	78.85	61.78	64.94	<.001
Time (slope)	-6.41***	.04	230	-6.15	-8.47	-4.36	<.001
Random Effects	(σ)						
Provider intercept	1.66	-	-	-	.63	4.36	-
L3-L1 cross-level							
interaction (slope)	2.52	-	-	-	1.11	5.70	-
Person intercept	10.53	-	-	-	7.27	15.23	-
L2-L1 cross-level							
interaction (slope)	9.03	-	-	-	3.33	24.47	-

Note. L3 = Level 3 (provider); L2 = Level 2 (person); L1 = Level 1 (time).
***$p < .001$.

Figure 4.

Multilevel Model 4 Graph

Figure 4. This graph represents the final model (Model 4) with no moderators. The x-axis is time (0 = pre-treatment, 1 = post-treatment) and the y-axis is total PCL scores. Each colored line represents a different veteran and indicates that veterans' PCL-M total scores decrease over time (i.e., a significant slope). PCL-M total scores also differ by person (different intercepts) and there are both random effects of time (slope) due to provider and random effects of time (slope) due to person.

Moderator Testing: Potential moderators were added as main effects and cross-level interaction terms to evaluate whether they were associated with average PCL-M total scores or moderated improvement in PCL-M over time (Table 22). Main effects assessed the moderation of a variable (e.g., race) on the PCL-M total score at pre-treatment (intercept), while the interaction terms assessed the moderation of the slope of the PCL-M over time. The equation

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used for moderating variables was: PCL-M$_{ijk}$ = ((δ_{000} + v_{0k}) + γ_{0jk}Moderator$_j$ + u_{0jk}) + ((δ_{100} + v_{1k})

+ γ_{1jk}Moderator$_j$ + u_{1jk})Time$_{ijk}$ + r_{ijk}.

Race of the participant showed no evidence of a main effect B = .30, p = .80, or cross-level interaction, B = 1.45, p = .28. Thus, there was no statistically significant difference in PCL-M total symptom scores at pre-treatment by race of veteran, and race did not predict improvement in PCL-M scores over time.

Next, age was tested as a potential moderator. Slope and intercept were allowed to vary. Age of the participant showed no evidence of a main effect, B = -.06, p = .19, or cross-level interaction, B =.0004, p = .99. Thus, there was no statistically significant difference in PCL-M total scores at pre-treatment by age of the veteran and there was no significant difference between veteran age in improvement over time.

Substance use disorder diagnosis and mood disorder diagnosis were also tested as potential moderators. Again, slope and intercept were allowed to vary. A mood disorder diagnosis did show evidence of a main effect, B = 4.31, p < .001, but not a cross-level interaction, B = -.83, p = .53. Thus, veterans with a mood disorder diagnosis had significantly higher PCL-M total scores at pre-treatment compared to those veterans without a mood disorder diagnosis, but a diagnosis of a mood disorder made no difference in veteran improvement over time. Substance use disorder diagnosis showed no evidence of a main effect, B = .61, p = .61, or a cross-level interaction, B = .79, p = .55.

Finally, two variables were tested as potential moderators to assess whether the racial composition of groups or the racial minority composition of the groups affected treatment outcomes (i.e., a reduction in PCL-M total scores). Both of the variables of racial composition (i.e., percentage of the group that are non-Hispanic African-American) and racial/ethnic minority

composition (i.e., percentage of the group that are racial or ethnic minorities) were entered as

Level 2 variables. In other words, these variables assessed how much the group was

concordant/discordant for each person based on their own individual race. Again, slope and

intercept were allowed to vary. Racial composition of the group showed no evidence of a main

effect, $B = -.03$, $p < .45$, or a cross-level interaction, $B = .03$, $p = .40$. Similarly, the racial

minority composition also showed no evidence of a main effect, $B = -.02$, $p < .58$, or a cross-

level interaction, $B = -.05$, $p = .18$. Thus, neither racial composition nor minority composition of

the groups made a difference in PCL-M total symptom score at pre-treatment or in PCL-M

improvement over time.

Table 22

Multilevel Model with Moderators

Moderator	Term	Estimate (B)	SE	df	t	Lower	Upper	p
Participant race								
	Main effect	.30	1.19	393	.25	-2.05	2.65	.80
	Cross-level interaction	1.45	1.33	229	1.09	-1.17	4.07	.28
Age								
	Main effect	-.06	.04	393	-1.31	-.14	.03	.19
	Cross-level interaction	<.01	.05	229	.01	-.10	.10	.99
Mood disorder diagnosis								
	Main effect	4.31***	1.18	385	3.65	1.98	6.63	<.001
	Cross-level interaction	-.83	1.33	222	-.62	-3.46	1.80	.53
Substance use disorder diagnosis								
	Main effect	.61	1.21	390	.51	-1.76	2.98	.61
	Cross-level interaction	.79	1.34	227	.59	-1.85	3.44	.55
Racial composition of groups								
	Main effect	-.03	.03	392	-.76	-.09	.04	.45
	Cross-level interaction	.03	.04	229	.85	-.04	.11	.40
Racial/ethnic composition of group								
	Main effect	-.02	.02	393	-.55	-.07	.04	.58
	Cross-level interaction	.04	.03	229	1.35	-.02	.11	.18

***$p < .001$.

Discussion

The purpose of the current study was to explore whether there are racial differences in PTSD symptomology among veterans with PTSD who are referred for group therapy, whether group therapy is an effective treatment for reducing symptoms of PTSD in non-Hispanic African American and non-Hispanic Caucasian male veterans with PTSD, and the factors that influenced the effectiveness of the PTSD Recovery Program. This chapter will first review and discuss the results of this study. Additionally, the chapter will compare the current results to previous findings related to group therapy for veterans with PTSD and health disparities in racial minorities. Strengths, limitations, implications, and suggestions for future research will also be discussed.

Summary of Findings

Hypothesis 1 proposed that non-Hispanic African American male veterans would report more severe PTSD symptoms (i.e., higher total PCL-M scores) at intake compared to non-Hispanic Caucasian male veterans. Results revealed that total PCL-M scores were not significantly higher for non-Hispanic African American veterans compared to their Caucasian peers. As stated previously, studies that have examined racial differences in PTSD symptoms produced inconsistent findings (Pole, Gone, & Kulkarni, 2008). Although at least 15 previous studies have demonstrated that racial or ethnic minority veterans report more severe PTSD symptoms compared to Caucasians (e.g., Boscarino, 2008; Dohrenwend, 2008; Greenawalt et al., 2013; Tuerk et al., 2010), another set of studies found no differences between these groups in overall symptomology (e.g., Baker et al., 2009; C'de Baca, Castillo, & Qualis, 2012; Macdonald et al., 2013). Thus, current results are consistent with some previous findings and inconsistent with others.

There are several potential explanations for these inconsistencies. First, differences in the measures used across studies may explain mixed findings. Although some researchers use structured clinical interviews to assess PTSD symptomology, others use self-report measures such as the PCL-M. Although many studies include comparisons between clinical interviews (e.g., the SCID) and self-report measures to ensure they are both assessing PTSD symptoms consistently, few studies have compared the validity of the two types of measures based on participants' race. Most of the studies reporting no racial differences in PTSD symptomology used measures other than the PCL (e.g., Baker et al., 2009; C'de Baca, Castillo, & Qualis, 2012; Monnier et al., 2002). It is plausible that there are differences in how a veteran may respond to a self-report measure versus a clinically administered measure, based on the veteran's race. For example, African American patients have reported that the race of their medical provider matters (Chen et al., 2005; LaVeist & Carroll, 2002). Thus, veterans may respond differently to a Caucasian provider assessing PTSD compared to an African American provider. In addition to responding differently based on the race of the provider, a patient may respond differently when the assessment is self-report versus clinician-administered. However, similar to the current study, MacDonald and colleagues (2013) found no differences in PTSD symptomology by veterans' race using the PCL-M and the CAPS. Additional research is needed to see whether findings from MacDonald and colleagues (2013) can be replicated.

Second, the relation between PTSD symptomology and race may be highly complex and still not well enough understood to enable researchers to assess the relationship between the two variables. As stated previously, PTSD is a highly complex disorder which is currently (in the DSM-5) based on the 20 different symptoms making up four symptom clusters (Brewin, 2013) for a total of 636,120 heterogeneous symptom combinations (Galatzer-Levy & Bryant, 2013).

Assessing the variable of race may not be sufficient to truly understand cultural and historical differences between groups of people. Kirmayer and Sartorius (2007) suggested that researchers and clinicians must "go beyond conventional group labels to examine the specific biological, psychological, or social mediators of cultural differences" (p. 832) when assessing historical trauma. They also suggested that adding a symptom cluster related to somatic symptoms to PTSD could help to better understand the disorder across cultures. In regards to whether the current American DSM-5 and ICD diagnoses can be applied cross- culturally, Hinton and Lewis-Fernández (2011) stated that the current research is "suggestive, but not conclusive, of cultural variability in the conditional probability of PTSD" (i.e., whether certain groups have higher rates of PTSD given the same degree of trauma; p. 789). This argument, that PTSD is constructed from a Western point of view and thus measured based on a set of Western-based criteria, would provide support for why the current study found no differences in PTSD based on race. Thus, it is possible that true PTSD symptoms were not accurately measured in the present study.

Third, this study used race as a proxy to measure another construct, race-related stress. The true hypotheses of this study should have been that African American veterans who experience high levels of race-related stress are more likely to have worse PTSD symptomology, in particular hyperarousal. Thus, it is possible that there were no significant differences in PTSD symptomology based on veterans' race because it is plausible that many African American veterans in this sample had experienced relatively low levels of race-related stress. In other words, if the African American veterans in this sample did not experience high levels of race-related stress, then they might have the same level of PTSD symptomology as Caucasian veterans, which is what was found. Whereas, if there was a sample with larger variability in the level of race-related stress in the African American participants, then race-related stress may

serve as a moderator between PTSD symptoms and race. It is also possible that African American veterans in this sample did experience race-related stress, but it did not increase the severity of their PTSD symptomology. It is important to acknowledge that there is diversity within any racial group (Pole et al., 2008), in addition to between-group differences. Race-related stress may differ based on many factors, such as geographic location, generational status, ethnic identity, and socioeconomic status. For example, differences have been found between African American and Caribbean Blacks in America in mental health service utilization (Neighbors et al., 2007). Thus, it should never be assumed that any racial group is homogeneous in their experiences.

A fourth explanation for the lack of differences between racial groups in hyperarousal is that some African Americans may learn to be hyperalert as a protective mechanism against racism, and thus experiencing a traumatic event may not exacerbate this symptom of hyperarousal. In Dr. Joy DeGruy Leary's (2005) book about what she terms "Post Traumatic Slave Syndrome," she illustrates a scenario in a public setting with both a Caucasian mother and African American mother with children. Dr. DeGruy explains that the African American mother must treat her children differently than the Caucasian mother; she must be more alert to danger and teach her children this skill because the world is not safe for them. This image illustrates how being hyperaware and alert can be protective when they have the lived experience of being treated negatively and their life is possibly in danger simply due to the color of their skin. Thus, it is possible that for some African Americans, the symptoms of hyperarousal serve as a protective mechanism against the racism they have faced, and if they develop PTSD this symptom is not further exacerbated.

A fifth explanation for the lack of racial differences in total PCL-M scores could be the sampling technique in the current study. Veterans in this study were not randomly selected to participate; rather this study only included veterans who had agreed to participate in group therapy following their intake session. Yet, there were a number of veterans who declined to participate in group therapy after their intake (however, the exact number cannot be determined without NEPEC data). Perhaps this produced a self-selection bias, such that some veterans were more likely than others to participate in group therapy. This selection bias could have resulted in certain differences between veterans who participated and those who did not. For example, it is plausible that veterans who were not in the study had more severe PTSD symptoms, less social support, fewer economic resources, or negative beliefs about psychotherapy. These differences may also vary by the race of the veterans. Indeed, previous research shows that racial minority veterans are less likely than Caucasian veterans to seek psychotherapy treatment (Roberts et al., 2011). Referrals to the PTSD clinic are also dependent on other providers making the referral; consequently, there could be differences in how African American and Caucasian veterans are referred. Thus, it is possible that racial differences in the PTSD symptomology of the McGuire VAMC veteran sample would have emerged in a random sampling of veterans. If the NEPEC data for the McGuire VAMC are eventually obtained, then future analyses could help answer this question by analyzing PTSD symptom severity for all veterans in the PTSD clinic at intake.

Hypothesis 2 stated that non-Hispanic African American male veterans would report more severe PTSD symptoms (i.e., higher PCL-M scores) for the symptom cluster of hyperarousal at intake compared to non-Hispanic Caucasian male veterans. Results from the current study indicated that hyperarousal was not significantly different based on veterans' race; rather, the symptom cluster of re-experiencing differed between racial groups. More specifically,

African American veterans had significantly higher scores on the re-experiencing symptom cluster compared to Caucasian veterans. This hypothesis about hyperarousal was based on transgenerational trauma theories, which suggest that African Americans may have higher stress levels due to their unique history in the U.S. in addition to the racial minority stress they may encounter.

There are many possible explanations for this null finding in hyperarousal symptoms between racial groups. One possibility is that non-Hispanic African American veterans may in fact not have higher levels of hyperarousal compared with non-Hispanic Caucasian veterans. If non-Hispanic African American veterans do not experience higher levels of hyperarousal than their non-Hispanic Caucasian peers then the findings of the current study would be consistent with some research (Koo et al., 2015) and inconsistent with other research (Ortega & Rosenheck, 2000).

An explanation for the mixed findings across studies regarding racial differences in symptom clusters is that our current understanding and measurement of PTSD may still be incomplete and/or inaccurate. For example, the current study assessed racial differences in symptom clusters based on a four-factor model that aligns with the DSM-5. However, the DSM-IV previously defined PTSD with a three-factor model and more recent research suggests that a seven-factor model of PTSD is more appropriate (Pietrzak, Tsai, Armour, Mota, Harpaz-Rotem, & Southwick, 2015; Seligowski & Orcutt, 2016). Furthermore, Pietrzak and colleagues (2014) conducted a latent class analysis on data with a veteran sample and found three different PTSD typologies, one of which they termed "Anxious-Re-experiencing." These authors suggest that an individual exhibiting the Anxious-Re-experiencing typology demonstrates a high level of re-experiencing symptoms and a low level of hyperarousal symptoms compared to individuals with

other typologies. Hinton and Lewis-Fernández (2011) also argue in regards to PTSD symptom cluster differences, that "although… differences in symptom expression may be found in particular [racial] groups, a consistent pattern of differences is rarely revealed" (p. 792). Thus, differences in PTSD symptom cluster definitions could account for inconsistent results across studies regarding racial group differences in symptom cluster scores. Further studies are necessary to clarify the structure of PTSD symptom clusters.

The finding in this study that there were significant differences in the PTSD symptom cluster of re-experiencing is not without precedent in the literature. Koo and colleagues (2015) similarly found that African American veterans reported higher re-experiencing symptoms compared to Caucasians. However, these authors also found that all symptom clusters except hyperarousal were higher for African American veterans. One possible explanation for racial differences in re-experiencing scores is that Caucasians may be more likely than African Americans to take medication for sleep concerns and nightmares, thus reducing their re-experiencing symptoms. Indeed, previous research suggests that African Americans are less likely than Caucasians to use medications to treat mental health concerns (Cooper et al., 2003; Han & Liu, 2005). However, because coding medication use was complex and beyond the scope of this study, this explanation could not be tested with these data.

A second explanation for the results of Hypothesis 2 could be that a third variable not measured in this study is moderating the relation between race and re-experiencing symptoms. Supporting this explanation, prior research suggests that re-experiencing symptoms are associated with physical health functioning (Asnaani, Reddy, & Shea, 2014) and bodily pain (Asnaani et al., 2014; Stratton, Hawn, Amstadter, Cifu, & Walker, 2014). Thus, other variables, such as physical health and bodily pain, could be influencing and exacerbating re-experiencing

symptoms more so for non-Hispanic African Americans than for non-Hispanic Caucasian veterans. Nonetheless, measures addressing these and similar variables were not included in the current study, and subsequently it was not possible to control for them in analyses.

Hypotheses 3 and 4 predicted that the PTSD Recovery Program would reduce PTSD symptoms for Caucasian and African American veterans, respectively. These hypotheses were supported, as results from multi-level modeling indicated that the PTSD Recovery Program significantly reduced PTSD symptoms for veterans, regardless of race. Moreover, additional analyses confirmed that there were no racial differences in treatment effectiveness over time (e.g., one racial group did not improve more than the other).

These results add to the literature on group therapy in addition to supporting that group therapy is an effective form of treatment for reducing symptomology (Castillo et al., 2012; Ellis et al., 2014; Sloan et al., 2012; Sutherland et al., 2012), particularly for veterans with PTSD. Sripada and colleagues (2016) found that veterans whose first psychotherapy session is group therapy (versus individual therapy) attended a greater number of total psychotherapy visits and were two times as likely to receive the minimally effective dose of treatment (8 or more sessions). Last, results from the current study showed that the PTSD Recovery Program was effective regardless of which group veterans participated in or who provided their treatment, suggesting that all providers were providing effective treatment.

However, statistically significant reduction in PCL-M scores is not necessarily the same as a clinically significant reduction in symptoms. Despite the significant 6-point reduction in mean PCL-M scores from pre- to post-treatment in this study, it does not appear that veterans, on average, had a clinically significant reduction in PTSD symptomology. For example, several sources suggest that at least a 10-point reduction in PTSD scores (as measured by the PCL) is

necessary to indicate clinically significant symptom improvement (Monson et al., 2008; U.S. Department of Veteran Affairs, 2012). Thus, the 6-point mean reduction in this study, although statistically significant, did not reach the 10-point threshold for clinical change. Furthermore, based on the standards for diagnosing PTSD at the McGuire VAMC (i.e., a PCL-M score of 55 or higher) it could be concluded that there were racial differences in who met the criteria for a PTSD diagnosis at post-treatment. More specifically, on average at post-treatment, non-Hispanic Caucasian veterans were just below a score of 55 and non-Hispanic African Americans were slightly above a score of 55, indicating that only non-Hispanic Caucasian veterans met McGuire's cut-off score for a PTSD diagnosis. However, it should be noted that there was within-group variability in the study, especially given that close to 20% participants in each racial group did show clinically significant improvement. Thus, it matters how one defines clinically significant improvement, whether by reduction in symptoms or by total symptom score at post-treatment, when interpreting the results of Hypotheses 3 and 4.

In addition to PTSD symptom reduction, session attendance or treatment dropout may also be indicators of treatment effectiveness. The McGuire VAMC defines treatment dropout as attending fewer than eight group sessions, requiring that these veterans repeat the PTSD Recovery Program. Using the McGuire VAMC metric for dropout, 32% of veterans in this study were classified as dropping out of group therapy. However, other researchers and clinicians define dropout as attending fewer than six (Tuerk et al., 2011) or seven sessions (Mott, Mondragon et al., 2014). When applying these metrics to the current study, only 23.3% of participants attended fewer than seven sessions and 16.4% attended fewer than six sessions. In interpreting the current findings, it might also helpful to compare the dropout rates of veterans in this study to dropout rates when using the "gold standard" treatments for PTSD. Indeed, a review

of PE and CPT treatment suggests that dropout rates may be as high as 50% (Schottenbauer, Glass, Arnkoff, Tendick, & Gray, 2008). Another literature review suggested that the average PE and CPT dropout rates are around 36% (Imel, Laska, Jakupcak, & Simpson, 2013). Interestingly, these authors found that group modalities were associated with higher dropout rates compared to individual therapy. By these standards, the McGuire PTSD Recovery Program may be considered effective simply due to the lower dropout rates observed, particularly when compared to gold standard treatments.

Furthermore, the current study assessed what factors were associated with group therapy dropout. Results revealed that session attendance was associated with age of the veteran (i.e., older veterans attended more sessions), but not associated with education level of the patient or with provider's years of experience. The current findings are partially consistent with a meta-analysis of adult psychotherapy (Swift & Greenberg, 2012) which suggested that therapy dropout is influenced by age (i.e., younger patients had higher dropout), education level (i.e., individuals who completed therapy were more educated), provider experience (i.e., more experienced therapists had higher retention rates), and client diagnoses (i.e., individuals with personality disorders had high dropout rates). Previous research also suggests that minority status may be linked to therapy dropout (Lester et al., 2010; Rosenheck et al., 1995). However, the current study found no differences in session attendance by race of the veteran. Thus, African American and Caucasian veterans received an equal number of therapy sessions. It is possible that minority status was not predictive of therapy dropout in our sample due to the high composition of racial minority veterans in groups, a variable which was examined in the research question.

The research question in this study assessed whether the racial composition of therapy groups would be associated with treatment outcomes, such as PTSD symptom reduction or

session attendance. The racial composition (i.e., percentage of non-Hispanic African Americans in the group) and the racial/ethnic minority composition (i.e., percentage of any racial or ethnic minority in the group) were not significantly related to most treatment outcomes. Only one association related to racial composition and session attendance emerged. Non-Hispanic Caucasian veterans were more likely to drop out of treatment when the racial composition of the group was more racially/ethnically discordant (i.e., fewer non-Hispanic Caucasians in the group). However, racial composition of the therapy groups was not associated with a reduction in PTSD symptoms for either racial group.

There are a number of possible explanations for the finding that group composition did not affect PTSD symptom reduction. First, it is possible that group racial composition simply does not affect PTSD symptom reduction. Although it was hypothesized that non-Hispanic African American veterans would experience greater treatment benefits (i.e., a greater reduction in PTSD symptoms) from being in groups with a high percentage of racially concordant peers, this was not found in the current study. Non-Hispanic African Americans may simply be accustomed to certain racial dynamics in the U.S. For example, racial and ethnic minority groups in the U.S may be accustomed to being a minority in various settings that are largely dominated by Caucasians.

Another explanation for why the results of this study did not show differences in therapy outcomes based on racial composition could be due to the population from which this sample was drawn. More specifically, the McGuire VAMC has a high percentage of non-Hispanic African American veterans as therapy clients, with an average group racial composition of 60% non-Hispanic African American and 67% racial or ethnic minority veterans. Additionally, the group with the lowest minority composition consisted of 22% racial or ethnic minority veterans

(2 in a group of 9). Thus, no group was 100% non-Hispanic Caucasian and no group had only

one member who identified as a racial or ethnic minority. In fact, the study as a whole had more

than twice the number of non-Hispanic African American veterans than non-Hispanic Caucasian

veterans. It is possible that, at a VAMC with a much lower percentage of racial minorities, the

racial composition of the group would have a greater effect on treatment outcomes. Perhaps

given the large percentage of racial minority clients in treatment for PTSD, non-Hispanic African

American veterans at the McGuire VAMC did not feel that were the "token member" of their

racial group, as previous literature has suggested (Ofori-Dankwa & Julian, 2002).

A third explanation for the current findings is that racial composition of groups may have

been associated with some treatment outcomes, just not those measured by this study (i.e., PTSD

symptomology). Perhaps veterans in therapy groups with a high percentage of racial minorities

experienced an increased sense of social support, but not necessarily PTSD symptom reduction.

Furthermore, other factors may matter more in regards to treatment effectiveness than racial

composition of the group (e.g., treatment modality, group cohesion).

Fourth, the structure of group therapy may interact with racial composition to influence

symptom reduction. For example, the current groups used a structured, manualized treatment that

did not necessarily rely on relationships between group members (i.e., interpersonal processing)

to address presenting concerns. In contrast, interpersonal process therapy groups may allow for

more relational vulnerability from clients and possible discussion of race-related matters. Had

McGuire VAMC groups used an interpersonal process model of therapy, the racial composition

of the group may have been more salient and, thus, exerted a larger influence on outcomes. This

critique is not intended to imply that manualized group treatments discourage race-related

discussions, only that such discussions may be less likely. Thus, if the groups do not address

race-related issues, then the racial composition of the group may matter less in terms of symptom reduction.

In assessing the research question, whether the racial composition of therapy groups would be associated with treatment outcomes, one treatment outcome was significantly associated with the racial composition of groups. The percentage of racial or ethnic minority members in therapy groups was negatively associated with the number of sessions attended, but only for non-Hispanic Caucasian veterans. This finding, that non-Hispanic Caucasians may prefer more racially concordant groups (as measured by session attendance), is consistent with previous research and theory on interracial relations. As noted in the literature review, Caucasian individuals report more anxiety when interacting in interracial dyads compared with same-race dyads, regardless of whether the discussion is race-related (Trawalter & Richeson, 2008). Additionally, Yalom's (2005) argument that group therapy should be a social microcosm tentatively suggests that Caucasians might feel unconformable in a group that does not mimic the real world in which Caucasians are typically the numerical majority. Research on implicit racial bias also supports these findings. Although most people tend to have strong implicit pro-White biases, these biases are strongest for Caucasians (Nosek et al., 2007). This suggests that, even on an implicit level, Caucasians may prefer to be in therapy groups that are more racially concordant and when the group composition is racially discordant, dropout may increase. On the contrary, non-Hispanic African Americans in the PTSD Recovery Group may have been less affected by the group racial composition given the relatively large percentage of racial and ethnic minority clients in the groups.

Several additional results separate from the main hypotheses are important to consider. First, the PCL-M demonstrated good psychometric qualities in the sample of non-Hispanic

African Americans. Researchers have previously recommended that additional studies should be conducted to examine the psychometric properties of the PCL with minorities (Malcoun, Williams, & Nouri, 2015). Second, the pre-treatment PCL-M total score was not associated with the number of sessions veterans attended. This finding suggests that the PTSD Recovery Program was effective for veterans with a range of PTSD severity and that the severity of PTSD was not associated with participants dropping out of treatment. Third, wait time for treatment was not significantly related to session attendance in the present study. This finding for wait time and session attendance is consistent with previous research by Sripada and colleagues (2016), that initial participation in group therapy (versus individual therapy) is associated with a larger number of therapy sessions attended. Last, veterans with mood disorder diagnoses, compared to those without, had higher pre-treatment PCL-M scores. This is not surprising given the substantial overlap between symptoms of PTSD and other mood disorders. It is possible that this association was not found in individuals with substance use disorders because many veterans with dual diagnoses (PTSD and substance disorders) are referred for treatment for the substance disorder before beginning PTSD treatment.

Strengths and Limitations

The current study has a number of strengths. To the author's knowledge, this is the first study to assess the association between racial composition of groups and treatment outcomes in a sample of veterans with PTSD. Because veterans may be a particularly vulnerable clinical population, this study consequently makes an important contribution to the literature. For example, there has been an increase in veteran suicide rates in recent years. Additionally, Tanielian and Jaycox (2008) stated that attending to veterans with PTSD is a "national priority" (p. xxxii), with large-scale ramifications if proper care is not implemented. Additionally,

although research has increasingly focused on veterans' mental health concerns, a great deal remains unknown about the long-term impacts of war on veterans' well-being. Similarly, some authors argue that the VA has not adequately evaluated the treatment modalities it commonly uses to address PTSD in veterans (IOM, 2014). Thus, the current study adds to this growing literature by providing empirical evidence regarding the effectiveness of a specific VA treatment for PTSD. Furthermore, this study is one of the first to examine whether group therapy is differentially effective for non-Hispanic Caucasian and non-Hispanic African American veterans. Therefore, the current study makes an important step toward understanding mental health disparities in PTSD based on veterans' race. Indeed, developing a better understanding of the factors that contribute to racial differences in PTSD could inform best practices in clinical work generally and group therapy in particular.

A second strength of the current study is its focus on mental health disparities based on racial minority status. Previous research has outlined that African Americans are more likely to experience physical and environmental disparities in comparison to Caucasian Americans. For example, the Centers for Disease Control and Prevention (2013) reported that Black Americans have a higher likelihood of infant mortality, being a victim of homicide, periodontitis, diabetes, teenage pregnancy, unemployment, premature death from stroke or coronary heart disease, and living below the federal poverty line. However, much less research has examined mental health disparities based on an individual's race, particularly as it interacts with other identities. For instance, much previous research has focused on one aspect of an individual's identity (e.g., race) without taking into consideration other aspects (e.g., veteran status). To partially address this theoretical and empirical gap, the current study examined two characteristics related to a potentially vulnerable identity (i.e., race and veteran status) in relation to PTSD. More

specifically, this study conducted separate analyses on outcomes based on veteran race and the racial composition of the therapy groups in which the veterans participated. This study also provided favorable psychometric evidence for the PCL-M in a non-Hispanic African American sample. Although current findings are complex, this study makes an important contribution toward understanding the race-related factors that may be associated with mental health disparities for non-Hispanic African American veterans with PTSD. Indeed, the Centers for Disease Control and Prevention (2013) explained that prevention can be successfully implemented only through awareness and identification of the factors associated with health disparity problems.

An additional strength of the current study is its large and heterogeneous sample. Indeed, previous research focusing on PTSD in veterans has typically involved insufficiently powered analyses and small samples. In contrast, the current study had a large sample and therefore more statistical power to detect significant effects. Moreover, many studies have not controlled for additional variables known to influence PTSD (Brewin et al., 2000). However, in this study, several variables associated with PTSD were controlled for in the design and analyses. For example, results from previous research suggest that combat and non-combat veterans differ in the severity of their PTSD symptoms (Sloan et al., 2013). To address this difference, the current study included only veterans who had served in combat zones, thus eliminating a possible confounding variable that affects PTSD. Additionally, previous studies have not always controlled for veterans' era of service, rank, or other military demographic variables when studying PTSD-related symptoms. Due to the ability to select participants from a large and heterogeneous pool of veterans, these demographic variables were controlled for in the analyses.

Nonetheless, the current study has several limitations. The main limitations of this study relate to the sample, the measures used and variables that were and were not assessed, the research design, and the ability to test the theories that support the hypotheses. First, because the data were archival, it was not possible to randomly select the participants. Additionally, this study only included veterans accessing VA services in Richmond, Virginia. Veterans seeking services in other regions could differ significantly from veterans in this sample. Thus, generalization of current findings to a larger group of veterans should be done cautiously. Furthermore, only veterans who were accessing group therapy services were included in the analyses. Ideally, all veterans who attended a PTSD intake session would have been included in the study or data from a national representative sample of veterans would have been used for this study.

A second limitation of the study is in regards to the measures and variables that were and were not used. For example, the PCL-M was the sole measure of PTSD. Ideally, two or more measures of PTSD should have been used to ensure that any significant results would not be an artifact of a particular measure. Furthermore, assessing symptomology through clinical interviews is often viewed as a stronger methodological approach than the self-report measures used in the current study. Certain variables were also used as proxy variables. For example, education can be used to ascertain a level of socioeconomic status, but it would have been better to have assessed income level. Similarly, assessing marital status can help determine a participant's social support, but ideally a social support measure would be used. Last, veterans were classified in racial groups based on their medical charts. However, participants who have been categorized as African American are not a homogenous group. Given that any medical charting classification system is not perfect, it is likely that some individuals were Caribbean

American, African, mixed racial or ethnic background, African American, or other racial and ethnic identities. Veterans' families may have also varied in regards to how long they have resided in the United States. Because the transgenerational trauma theory was used as a basis for this study, it would be presumed that individuals had an African American cultural heritage dating back many centuries. However, the variable of racial identity could have been assessed directly.

The method of extracting data from chart review was also problematic. The CPRS, although beneficial for many reasons, is still an imperfect system for compiling patient data. The section of CPRS titled "problem list" was developed to be a complete list of all of a veteran's diagnoses. However, diagnoses added to this list are often not removed when they are no longer accurate. Additionally, diagnoses such as mental health diagnoses can also be added to the problem list by any provider, regardless of degree or training, and may not always be based on full DSM-5 criteria. It is also not uncommon for a diagnosis such as Anxiety Disorder to be added to a problem list before the veteran is accurately diagnosed with PTSD. It is also possible that a diagnosis (e.g., depression) was added to the problem list after a veteran completed the group therapy, and thus included in the demographic data for the participant for the purpose of this study, despite occurring after the PTSD Recovery Program was finished. One limitation of the problem list is that it only indicates when a diagnosis is entered into the client's medical record and not when the illness occurred.

Due to the archival nature of this study, other important variables could not be assessed. For example, this study did not include measures to assess variables that may be associated with treatment outcomes, such as depression, loneliness, social support, group cohesion, and/or attitudes toward psychotherapy. Similarly, research has suggested that medication use is

associated with factors that are associated with PTSD, such as sleep and bodily pain. Yet, the current study did not measure medication usage due to the complexity how this variable was recorded in the VA medical charts and the high utilization of medications to treat veterans seeking services at VAs. Although medication use could not be controlled for or assessed as a moderating variable in the current study, medication type, amount, and adherence should be measured and controlled for in future studies. In addition, it was not possible in the current study to measure some variables that are often associated with race, such as socioeconomic status (SES). The variable of education was used as a proxy of SES but is not the same construct. Also, it would have been beneficial to assess where participants lived, as certain areas may be associated with higher rates of neighborhood violence.

Furthermore, although the race of veterans was a focal point of the current study, the race of providers was not included in analyses, as most providers identified as non-Hispanic Caucasian. Ideally, the sample of providers would be diverse enough to measure whether the variable affects treatment outcomes. Previous research examining cross-racial dyads in therapy settings show that provider race is associated with treatment outcomes (Cabral & Smith, 2011; Farsimadan, Draghi-Lorenz, & Ellis, 2007). Nevertheless, little research has focused on how therapists' race in group settings affects therapeutic outcomes, such as symptom reduction and session attendance. Adding another layer of complexity, most of the groups in the current study had co-therapists. Although most of the co-therapists were also non-Hispanic Caucasian, demographic characteristics of the co-therapist would be an important variable to consider in the future.

An additional limitation regarding variables that were not assessed is that this study did not control for various factors related to the traumas experienced by these veterans. For example,

type of trauma that causes PTSD, the frequency of traumas, and the severity or duration of traumas may be important (Hinton & Lewis-Fernández, 2011), but these variables were not assessed in the original data collection. There are many types of traumas that a veteran with PTSD may have experienced and meta-analyses have shown that the type of trauma moderates treatment effects (Sloan et al., 2013). Also, the proximity of the trauma may matter, such that a veteran may respond differently to personally experiencing a trauma versus learning about a trauma experienced by a close friend. This study also did not measure the number of traumas that each veteran experienced during their military service. Individuals who have experienced a greater number of traumas have been shown to differ from those who experienced fewer traumas (Felitti et al., 1998). Thus, in future studies assessing treatment outcomes in veterans, it would be important to measure and control for the type of trauma, the proximity of the trauma, and the number of traumas veterans have experienced.

A third limitation of this study is in regards to the research design. A major limitation is that this study did not include a control group. For a better assessment of the effectiveness of the PTSD Recovery Program, a randomized controlled trial should be conducted in which veterans are randomly assigned to either a control (waitlist for treatment) or treatment group. In terms of assessing PTSD symptom reduction, it would have helped if PTSD symptomology could have been assessed at more than the three time points (i.e., intake, pre-treatment, post-treatment). The study's quality would have been improved if PTSD symptoms had been measured after the final session, in addition to multiple times 6 to 12 months post-treatment. These follow-up time points would help to better assess long-term symptom reduction and treatment effectiveness.

A fourth limitation of this study is in regards to testing the theoretical rationale for the hypotheses. Although the transgenerational trauma theory and the minority stress model were

used to develop hypotheses in this study, there were no actual measures included that assessed either theory. Ideally, a measure of race-related stress or experiences of racism would have been included. As a result, it was assumed that all African American veterans experienced race-related stress, which presumably led to higher hyperarousal symptoms and higher PTSD total symptoms. However, because race-related stress was not assessed, this assumption could not be empirically tested.

Implications

The results of this study have implications for researchers. For example, it is important to consider that not all treatment modalities are equally effective for every client. Only by assessing group differences in treatment outcomes based on race or other demographic variables will researchers develop a better understanding of the effectiveness of various treatments. This study also supports the idea that our current conceptualization and measurement of PTSD may be insufficient and inaccurate. Although most research examines PTSD symptomology as one variable, it may be more helpful to examine specific symptoms or symptom clusters when assessing differences by race and other variables. Additionally, a broader understanding of the mechanisms and processes associated with group therapy is required when examining treatment outcomes. For instance, the majority of the research examining group therapy for veterans with PTSD does not assess factors such as social support, group cohesion, race of provider, or racial composition of groups. Yet, previous social psychology and clinical psychology research has demonstrated that these factors do, in fact, influence treatment outcomes.

The current results have equally important implications for therapists. The effectiveness of the PTSD Recovery Program in this study suggests that there are alternative options to treat PTSD other than CPT or PE. Although VAs across the country favor these two treatment

approaches, it may be worth considering other approaches, particularly when dropout rates for veterans participating in the PTSD Recovery Program in the current study were comparable to or better than those observed for other approaches. Additionally, veterans who are not yet ready for the level of commitment or intensity that CPT and PE require may prefer the PTSD Recovery Program's focus on skill-building in addition to symptom reduction. It is possible that the PTSD Recovery Program may better equip participants for CPT or PE, or allow for those therapies to be shortened. Results of the current study also imply that therapists may need to consider the composition of therapy groups along multiple variables, such as race and/or gender. This study specifically found that Caucasian veterans may be more likely to drop out of treatment when groups consist of a high percentage of racial minority veterans. If future studies replicate this result, then race would be an important factor for therapists to consider when leading racially diverse groups. This is not to suggest that therapists would want to limit the number of participants from one or another racial background, but therapists would want to consider how the racial dynamics of group membership may affect therapy outcomes. Although not all treatment modalities and approaches are equally effective across social groups, this study found that the PTSD Recovery Program was effective for both non-Hispanic African American and Caucasian veterans. This is important to note, given that it should not be assumed that every type of therapy is equally effective for all types of clients.

Future Directions

This study compared only non-Hispanic African American and Caucasian veterans with PTSD, but future research should explore whether there are race-based differences in symptoms and treatment outcomes for other racial and ethnic minority groups. Future research should continue to examine both within-group (e.g., within African American samples) and between-

group (e.g., between African American and Caucasian samples) differences in PTSD symptomology and treatment outcomes with diverse participants. Given the mixed results that have been found regarding PTSD symptomology and race, a meta-analyses could be conducted to provide further insight. Overall, there is a need for researchers to conduct more studies with either truly representative samples or samples with higher numbers of racial or ethnic minorities. Otherwise, it is not appropriate to generalize conclusions drawn from analysis of largely Caucasian samples to racial and ethnic minority veterans.

Similarly, future researchers should assess how racial dynamics and racial composition of groups are associated with treatment outcomes. Additional research is obviously needed to better understand how racial composition of groups affects therapy outcomes for Caucasians, African Americans, and other minority groups. Ideally, future research would assess treatment outcomes for psychotherapy groups that are all one racial/ethnic composition, as well as groups with a full racial composition range. It is also possible that the racial composition of therapy groups affects treatment outcomes differentially based on the type of modality used (e.g., manualized treatment versus interpersonal processing groups), a relation that should be investigated in future research. Furthermore, the relationship between race of provider(s) and participants/clients should be explored in terms of the association with treatment outcomes.

Continued research validating psychotherapy treatment and assessment tools with racial and ethnic minorities would be beneficial. Psychotherapy treatments that are implemented – whether evidenced-based or not – need to be validated for use with diverse samples. In particular, additional research should focus on effective treatment for racial and ethnic minority veterans with PTSD as well as other mental health problems. As is that case for treatment effectiveness, it should not be assumed that a particular measure is valid for a group of

individuals without validating the measure on that population first. Assessment tools that are used to measure PTSD, such as the CAPS-5 and the PCL-5, should be validated with diverse samples to help better understand whether the manifestations of PTSD are consistent across racial/ethnic groups.

Because this study was limited to veterans who attended group therapy, future research could analyze data from all veterans with PTSD at the McGuire VAMC. Future research should also examine PTSD in veterans across multiple VA systems, as well as among veterans who do not receive services at VAMCs. Veterans who seek services at the VA may not be fully representative of all military personnel, possibly due to factors such as access to treatment, stigma of seeking mental health services, and/or current enlistment status. Samples of veterans may also differ significantly by geographic region; therefore, a representative sample from the entire U.S. would be optimal.

Additional variables should be included in future research to better test theories of transgenerational trauma and the minority stress model. Inclusion of race-related stress measures, measures of perceived discrimination, and life experiences of discrimination could clarify the relations of these variables to PTSD severity or specific PTSD symptom clusters. As noted earlier, measures assessing constructs such as social support, depression, group cohesion, bodily pain, physical functioning, and medication use would also help provide a more accurate picture of group therapy treatment effectiveness.

Conclusion

This study assessed whether there were racial differences between non-Hispanic African Americans and non-Hispanic Caucasians in PTSD symptomology in a sample of combat veterans from the McGuire VAMC. The study failed to show that African Americans had

significantly higher total PCL-M scores or higher hyperarousal symptom cluster scores at intake, but it did find that non-Hispanic African Americans had significantly higher re-experiencing symptom cluster scores at intake. This study also assessed the effectiveness of a 10-week group-based PTSD Recovery Program for non-Hispanic African American and non-Hispanic Caucasian veterans. Participation in the PTSD Recovery Program significantly reduced PCL-M scores at post-treatment for non-Hispanic African American and non-Hispanic Caucasian veterans, with no differences found based on veterans' race. Although the reduction in PCL-M scores did not reach the 10-point clinically significant cut-off suggested in previous literature, both groups of veterans had mean PCL-M scores at post-treatment that were roughly at or below the McGuire VAMC's cutoff score for diagnosing PTSD. Additionally, of those veterans who provided pre- and post-test data (50%), 9% showed a response to treatment and 20% showed a clinically significant decline in symptoms. A total of roughly 37% of the veterans who provided data reported a decrease in their symptoms as assessed by the PCL-M.

Furthermore, group therapy dropout rates for this sample were lower than those reported in previous studies for CPT and PE approaches, indicating that the PTSD Recovery Program may be as or more effective than these treatment approaches (as measured by attendance/attrition). Results from multilevel modeling demonstrated that the majority of the variance in symptom reduction was within-person (due to pre- and post-treatment) differences, rather than between groups or between providers. This suggests that therapists were providing similar and effective treatment across providers and across groups. Last, this study explored which variables were associated with treatment outcomes and specifically whether racial composition of the group affected PTSD symptom reduction. Although there was no effect of racial composition of the groups on PTSD symptoms, Caucasian veterans attended fewer

sessions in groups that were more racially discordant. No such effects were found for African American veterans. Future research should continue to examine the effectiveness of novel group therapies for veterans with PTSD, as well as differences in PTSD symptomology and treatment outcomes based on client factors such as race and ethnicity.

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Appendix A

Demographic Data From PTSD Intake Form

Date of Birth…

Gender…   [ ] Male   [ ] Female

Marital Status (check one)

[ ] Married	[ ] Widowed	[ ] Divorced
[ ] Remarried	[ ] Separated	[ ] Never Married
[ ] Veteran refused to answer	[ ] Clinician failed to ascertain	

Race/Ethnic Ancestry (check all that apply)

[ ] White, not Hispanic	[ ] Hispanic, Black	[ ] Pacific Islander
[ ] Black, not Hispanic	[ ] American Indian/ Alaskan	[ ] Other
[ ] Hispanic, White	[ ] Asian	[ ] Unknown/ Veteran refused to answer
		[ ] Clinician failed to ascertain

*Did the Veteran suffer another traumatic incident within his/her life time that was not related to combat

[ ] No	[ ] Yes	[ ] Veteran refused to answer	[ ] Clinician failed to ascertain

If YES, which other type of traumatic incident (include both military and on-military)? (check all that apply)

[ ] Military Sexual Trauma	[ ] Victim of violence (e.g.) child abuse
[ ] Non-Military Sexual Trauma	[ ] Natural disaster

(Continues)

If YES, which other type of traumatic incident (include both military and on-military)? (check all that apply)

[ ] Vehicle accident   [ ] Other

[ ] Other accident   [ ] Veteran refused to answer

                   [ ] Clinician failed to ascertain

Number of years of education completed… [ ] [ ]

[ ] Veteran refused to answer   [ ] Clinician failed to ascertain

Is the Veteran working now? (check one)

[ ] No   [ ] Part-time   [ ] Full-time   [ ] Veteran refused to answer

                                                       [ ] Clinician failed to ascertain

In which Branch of the Military did you serve?

[ ] Army   [ ] Navy   [ ] Air Force   [ ] Marines

[ ] Coast Guard

Highest Rank:

Child abuse?   [ ] No   [ ] Yes

               If yes, was the abuse: [ ] Physical   [ ] Sexual   [ ] Emotional

Education: [ ] High School   [ ] GED   [ ] Bachelor's Degree   [ ] Associate's Degree

             [ ] Postgraduate Degree   [ ] Other

Employment: [ ] Stable employment   [ ] Non-stable employment

             [ ] Unemployed   Disabled

             [ ] Pensioner /Retiree

Note. * Questions administered by staff.

Appendix B

Posttraumatic Stress Disorder Checklist- Military Version (PCL-M)

Instruction to patient: Below is a list of problems and complaints that veterans sometimes have in response to stressful military experiences. Please read each one carefully, put an "X" in the box to indicate how much you have been bothered by that problem in *the last month.*

No.	Response:	Not at all (1)	A little bit (2)	Moderately (3)	Quite a bit (4)	Extremely (5)
1.	Repeated, disturbing *memories, thoughts, or images* of a stressful military experience?					
2.	Repeated, disturbing *dreams* of as stressful military experience?					
3.	Suddenly *acting or feeling* as if a stressful military experience *were happening again* (as if you were reliving it)?					
4.	Feeling *very upset* when *something reminded* you of a stressful military experience?					
5.	Having *physical reactions* (e.g., heart pounding, trouble breathing, or sweating) when *something reminded* you of a stressful military experience?					
6.	Avoid *thinking about or talking about a* stressful military experience or avoid *having feelings* related to it?					
7.	Avoid *activities or situations* because *they remind you* of a stressful military experience?					
8.	Trouble *remembering important parts* of a stressful military experience?					
9.	Loss of *interest in things that you used to enjoy?*					
10.	Feeling *distant or cut off* from other people?					
11.	Feeling *emotionally numb* or being unable to have loving feelings for those close to you?					
12.	Feeling as if your *future* will somehow be *cut short?*					
13.	Trouble *falling or staying asleep?*					
14.	Feeling *irritable* or having *angry outbursts?*					
15.	Having *difficulty concentrating?*					
16.	Being *"super alert"* or watchful or on guard?					
17.	Feeling *jumpy* or easily startled?					

Weathers, F.W., Huska, J.A., Keane, T.M. *PCL-M for DSM-IV.* Boston: National Center for PTSD–Behavioral Science Division, 1991.

Appendix C

Comparison of Posttraumatic Stress Disorder Checklist-Military (PCL-M) with DSM-IV and DSM-V Criteria and Clusters

Suggested Four-Factor Model	PCL-M	DSM-IV Criteria	DSM-IV Clusters	DSM-5 Criteria	DSM-5 Clusters
Reexperiencing	1. Repeated, disturbing memories, thoughts, or images of a stressful military experience?	Recurrent and intrusive distressing recollections of the event, including images, thoughts, or perceptions.	B1	Recurrent, involuntary, and intrusive distressing memories of the traumatic event(s).	B1 (Reexperiencing)
Reexperiencing	2. Repeated, disturbing dreams of a stressful military experience?	Recurrent distressing dreams of the event.	B2	Recurrent distressing dreams in which the content and/or affect of the dream are related to the traumatic event(s).	B2 (Reexperiencing)
Reexperiencing	3. Suddenly acting or feeling as if a stressful military experience were happening again (as if you were reliving it)?	Acting or feeling as if the traumatic event were recurring (includes a sense of reliving the experience, illusions, hallucinations, and dissociative flashback, episodes, including those that occur on awakening or when intoxicated).	B3	Dissociative reactions (e.g., flashbacks) in which the individual feels or acts as if the traumatic event(s) were recurring.	B3 (Reexperiencing)

Suggested Four-Factor Model	PCL-M	DSM-IV Criteria	DSM-IV Clusters	DSM-5 Criteria	DSM-5 Clusters
Reexperiencing	4. Feeling very upset when something reminded you of a stressful military experience?	Intense psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event.	B4	Intense or prolonged psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event(s).	B4 (Reexperiencing)
Reexperiencing	5. Having physical reactions (e.g., heart pounding, trouble breathing, or sweating) when something reminded you of a stressful military experience?	Physiological reactivity on exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event	B5	Marked physiological reactions to internal or external cues that symbolize or resemble an aspect of the traumatic event(s).	B5 (Reexperiencing)
Avoidance	6. Avoid thinking about or talking about a stressful military experience or avoid having feelings related to it?	Efforts to avoid thoughts, feelings, or conversations associated with the trauma	C1	Avoidance of or efforts to avoid distressing memories, thoughts, or feelings about or closely associated with the traumatic event(s).	C1 (Avoidance)

(Continues)

Suggested Four-Factor Model	PCL-M	DSM-IV Criteria	DSM-IV Clusters	DSM-5 Criteria	DSM-5 Clusters
Avoidance	7. Avoid activities or situations because they remind you of a stressful military experience?	Efforts to avoid activities, places, or people that arouse recollections of the trauma	C2	Avoidance of or efforts to avoid external reminders (people, places, conversations, activities, objects, situations) that arouse distressing memories, thoughts, or feelings about or closely associated with the traumatic event(s).	C2 (Avoidance)
Numbing	8. Trouble remembering important parts of a stressful military experience?	Inability to recall an important aspect of the trauma	C3	Inability to remember an important aspect of the traumatic event(s) (typically due to dissociative amnesia and not to other factors such as head injury, alcohol, or drugs).	D1 (Negative alterations in cognition/mood)
				Persistent and exaggerated negative beliefs or expectations about oneself, others, or the world.	D2 (Negative alterations in cognition/mood)

(Continues)

Suggested Four-Factor Model	PCL-M	DSM-IV Criteria	DSM-IV Clusters	DSM-5 Criteria	DSM-5 Clusters
				Persistent, distorted cognitions about the cause or consequences of the traumatic event(s) that lead the individual to blame himself/herself or others.	D3 (Negative alterations in cognition/mood)
				Persistent negative emotional state (e.g., fear, horror, anger, guilt, or shame).	D4 (Negative alterations in cognition/mood)
Numbing	9. Loss of interest in things that you used to enjoy?	Markedly diminished interest or participation in significant activities	C4	Markedly diminished interest or participation in significant activities.	D5 (Negative alterations in cognition/mood)
Numbing	10. Feeling distant or cut off from other people?	Feeling detachment or estrangement from others	C5	Feelings of detachment or estrangement from others.	D6 (Negative alterations in cognition/mood)
Numbing	11. Feeling emotionally numb or being unable to have loving feelings for those close to you?	Restricted range of affect (e.g., unable to have loving feelings)	C6	Persistent inability to experience positive emotions (e.g., inability to experience happiness, satisfaction, or loving feelings).	D7 (Negative alterations in cognition/mood)
Numbing	12. Feeling as if your future will somehow be cut short?	Sense of a foreshortened future (e.g. does not expect to have a career, marriage, children, or a normal life span)	C7		

(Continues)

Suggested Four-Factor Model	PCL-M	DSM-IV Criteria	DSM-IV Clusters	DSM-5 Criteria	DSM-5 Clusters
				Reckless or self-destructive behavior.	E2 (Arousal)
Hyperarousal	13. Trouble falling or staying asleep?	Difficulty falling or staying asleep	D1	Sleep disturbance (e.g., difficulty falling or staying asleep or restless sleep).	E6 (Arousal)
Hyperarousal	14. Feeling irritable or having angry outbursts?	Irritability or outbursts of anger	D2	Irritable behavior and angry outbursts (with little or no provocation) typically expressed as verbal or physical aggression toward people or objects.	E1 (Arousal)
Hyperarousal	15. Having difficulty concentrating?	Difficulty concentrating	D3	Problems with concentration.	E5 (Arousal)
Hyperarousal	16. Being "super alert" or watchful on guard?	Hypervigilance	D4	Hypervigilance.	E3 (Arousal)
Hyperarousal	17. Feeling jumpy or easily startled?	Exaggerated startle response	D5	Exaggerated startle response.	E4 (Arousal)

Note. DSM = Diagnostic and Statistical Manual of Mental Disorders; PCL-M = Posttraumatic Stress Disorder Checklist- Military.

Appendix D

Posttraumatic Stress Disorder (PTSD) Recovery Program Session Outline

Session Number	Session Outline/Agenda
Session 1	• Administration of assessment measures (e.g., PCL-M) • Group rules and guidelines • Psychoeducation about PTSD • Causes and triggers of PTSD • Avoidance and safety behaviors • Breathing retraining • Discuss following week's homework
Session 2	• Review homework • Review past material • Discussion of rationale for skill-based curriculum for PTSD • Introduction of real-time exposure activity exercises • Discussion of anxiety and negative emotions created by avoidance • Introduction of Subjective Units of Distress (SUDS) and rating anchor points • Complete personal hierarchy of triggers, safety behaviors, and avoidance behaviors • Discuss real-time exposure practice sheet for homework
Session 3	• Review homework • Review past material • Review common reactions to trauma • Introduce "Drop Three" relaxation exercise • Introduce self-talk • Discuss homework assignment
Session 4	• Review homework • Review past material • Practice breathing and self-calming phrase • Introduce mental and physical grounding skills • Introduce positive imagery exercise • Discuss homework assignment
Session 5	• Review homework • Introduce emotional numbing worksheet and exercises • Complete two-word "best self" statement • Review information about PTSD and substance abuse • Practice skills: breathing, saying calm phrase, and two-word statement • Discuss homework assignment

(Continues)

Appendix D (cont'd.)

Session Number	Session Outline/Agenda
Session 6	• Review homework • Practice skills: breathing, saying calming phrase, and two-word statement • Introduce anger worksheet • Introduce passive/aggressive/assertive concept of interacting with others • Oil check: review gains made during first five weeks and goals for moving forward • Discuss homework assignment
Session 7	• Review homework • Practice skills: breathing, saying calming phrase, and two-word statement • Introduce acceptance information • Discuss homework assignment
Session 8	• Review homework • Practice skills: breathing, saying calming phrase, and two-word statement • Introduce PTSD cognitive-behavior therapy triangle (thoughts, feelings, & behaviors) • Introduce common thinking errors (e.g., all-or-nothing thinking and emotional reasoning) • Introduce recovery thinking (challenging unrealistic thoughts) • Discuss homework assignment
Session 9	• Review homework • Practice skills: breathing, saying calming phrase, and two-word statement • Introduce themes of relapse, recover, and resiliency • Discuss homework assignment
Session 10	• Administration of assessment measures (e.g., PCL-M) • Review homework • Practice skills: breathing, saying calming phrase, and two-word statement • Rerate SUDS on original hierarchy list and discuss changes in SUDS ratings • Process group experiences and gains in recovery • Discuss treatment needs and options • Say goodbye

Note. PCL-M = Posttraumatic Stress Disorder Checklist- Military; PTSD = posttraumatic stress disorder.

Appendix E

Composition and Characteristics of Groups

Group	Actual group size	Members in analyses	Men		Non-Hispanic Caucasian		Non-Hispanic African American		Racial/ ethnic minority	
	N	n	n	$\%$	n	$\%$	n	$\%$	n	$\%$
1	11	10	11	(100.00)	6	(54.55)	4	(36.36)	5	(45.50)
2	10	9	10	(100.00)	4	(40.00)	6	(60.00)	6	(60.00)
3	7	6	7	(100.00)	1	(14.29)	5	(71.43)	6	(85.70)
4	9	8	9	(100.00)	3	(33.33)	5	(55.56)	6	(66.70)
5	11	9	11	(100.00)	2	(18.18)	7	(63.64)	9	(81.80)
6	9	9	9	(100.00)	3	(33.33)	6	(66.67)	6	(66.70)
7	12	9	12	(100.00)	2	(16.67)	8	(66.70)	10	(83.30)
8	8	7	8	(100.00)	4	(50.00)	3	(37.50)	4	(50.00)
9	11	10	10	(90.90)	4	(36.36)	7	(63.64)	7	(63.60)
10	11	10	11	(100.00)	6	(54.55)	4	(36.36)	5	(45.50)
11	6	6	6	(100.00)	1	(16.67)	5	(83.33)	5	(83.30)
12	11	11	11	(100.00)	3	(27.27)	8	(72.73)	8	(72.70)
13	9	8	9	(100.00)	4	(44.44)	4	(44.44)	5	(55.60)
14	12	8	11	(91.70)	3	(25.00)	6	(50.00)	9	(75.00)
15	9	9	9	(100.00)	2	(22.22)	7	(77.78)	7	(77.80)
16	11	7	9	(81.80)	2	(18.18)	7	(63.64)	9	(81.80)
17	9	9	9	(100.00)	7	(77.78)	2	(22.22)	2	(22.20)
18	14	12	13	(92.90)	7	(50.00)	7	(50.00)	7	(50.00)
19	14	14	14	(100.00)	5	(35.71)	9	(64.29)	9	(64.30)
20	7	5	7	(100.00)	3	(42.86)	3	(42.86)	4	(57.10)
21	11	10	11	(100.00)	7	(63.64)	3	(27.27)	4	(36.40)
22	13	11	12	(92.30)	7	(53.85)	5	(38.46)	6	(46.20)
23	10	8	9	(90.00)	2	(20.00)	7	(70.00)	8	(80.00)
24	11	11	11	(100.00)	3	(27.27)	8	(72.73)	8	(72.70)
25	8	6	8	(100.00)	2	(25.00)	4	(50.00)	6	(75.00)
26	9	8	8	(88.90)	4	(44.44)	5	(55.56)	5	(55.60)
27	12	10	12	(100.00)	7	(58.33)	5	(41.67)	5	(41.70)
28	7	5	7	(100.00)	2	(28.57)	5	(71.43)	5	(71.40)
29	7	6	7	(100.00)	2	(28.57)	4	(57.14)	5	(71.40)
30	11	8	11	(100.00)	1	(9.09)	8	(72.73)	10	(90.90)
32	14	12	14	(100.00)	6	(42.86)	7	(50.00)	8	(57.10)
33	10	9	10	(100.00)	6	(60.00)	4	(40.00)	4	(40.00)
34	14	14	14	(100.00)	2	(14.29)	12	(85.71)	12	(85.70)
35	13	13	13	(100.00)	4	(30.77)	9	(69.23)	9	(69.20)

(Continues)

Appendix E (cont.)

Group ID	Actual group size	Members in analyses	Men		Non-Hispanic Caucasian		Non-Hispanic African Americans		Racial/ ethnic minority	
	N	n	n	%	n	%	n	%	n	%
36	13	11	13	(100.00)	6	(46.15)	7	(53.85)	7	(53.80)
37	3	3	3	(100.00)	0	(0.00)	3	(100.00)	3	(100.00)
38	5	4	5	(100.00)	1	(20.00)	3	(60.00)	4	(80.00)
39	12	12	12	(100.00)	4	(33.33)	8	(66.67)	8	(66.70)
40	9	8	9	(100.00)	2	(22.22)	6	(66.67)	7	(77.80)
41	9	9	9	(100.00)	0	(0.00)	9	(100.00)	9	(100.00)
42	10	9	9	(21.43)	5	(50.00)	5	(50.00)	5	(50.00)
43	9	8	8	(18.60)	2	(22.22)	7	(77.78)	7	(77.80)
44	12	11	12	(27.27)	6	(50.00)	5	(41.67)	6	(50.00)
45	10	9	10	(22.22)	3	(30.00)	6	(60.00)	7	(70.00)
47	10	8	8	(17.02)	3	(30.00)	6	(60.00)	7	(70.00)
48	8	5	10	(20.83)	2	(25.00)	5	(62.50)	6	(75.00)
49	12	11	8	(16.33)	3	(25.00)	9	(75.00)	9	(75.00)
50	9	8	8	(16.00)	2	(22.22)	7	(77.78)	7	(77.80)
51	9	9	9	(100.00)	5	(55.56)	4	(44.44)	4	(44.40)
52	10	7	9	(90.00)	2	(20.00)	6	(60.00)	8	(80.00)

Note. Group 31 had missing data for pre- and post-treatment and is not included in analyses examining group therapy outcomes. Data from participants in group 31 were included in other analyses such as those assessing PCL-M scores at intake. Group 46 was all female and excluded from the study.

Vita

Jennifer Anne Coleman was born on December 30, 1982, in Madison, Wisconsin. She graduated from Madison West High School in Madison, Wisconsin in 2001. She received her Bachelor of Arts in Psychology and Social Behavior from the University of California, Irvine in June 2006. She worked as a research assistant and lab manager for the Aging, Culture, and Cognition lab at Brandeis University in Waltham, Massachusetts from August 2008 until August 2009. Subsequently she received her Master of Arts in Counseling from Boston College in Chestnut Hill, Massachusetts in May 2011. While studying at Boston College she worked as a research assistant for City Connects from September 2009 until June 2011. In 2013 she earned a Master of Science in Psychology from Virginia Commonwealth University. She is currently completing her predoctoral clinical internship at the Edward Hines, Jr. Veterans Affairs Hospital in Chicago, IL.