

Time Series Analysis of Posttraumatic Stress Disorder in Military Veterans: A Literature Review and Pilot Study

Steven F Werder, Kevin R Kupferer, Martha Kent

Research Service, Phoenix Veterans Administration Healthcare System, Phoenix, AZ, USA

Correspondence: Steven F Werder, Research Service, Phoenix Veterans Administration Healthcare System (VAHCS), 650 E. Indian School Road, Phoenix, AZ, 85012, USA, Email stevenwerder@hotmail.com

Introduction: We reviewed the historical, longitudinal concept, and current cross-sectional manifestations of posttraumatic stress disorder (PTSD). Commonalities include anxiety, dysphoria, defensiveness, dissociation, dysregulation (disinhibition), sleep disturbance, and somatization. Each of these, with the exception of somatization, is represented in the Diagnostic and Statistical Manual of Mental Disorders – 5-Text Revision (DSM-5-TR).

Methods: This cross-sectional pilot study sought to develop a time sequence, including demographics, trauma type, traumatic response, posttraumatic symptoms, and subjective interference (or impairment), and sought to determine how each factor in the time series relates to all later factors in the time series. The aims included (a) the effects demographics have on trauma type, traumatic response, posttraumatic symptoms, and subjective impairment, (b) the effects trauma type have on traumatic response, posttraumatic symptoms, and subjective impairment, (c) the effects traumatic response have on posttraumatic symptoms and subjective impairment, and (d) the effects posttraumatic symptoms have on subjective impairment. This was an exploratory qualitative and quantitative inquiry using cross-sectional information from a pre-existing dataset. Variable types were defined. Then statistical tests were determined using IBM Statistical Package for the Social Sciences (SPSS) software, Version 26.

Results: Along the time series, both qualitative and quantitative variables were assessed. Qualitatively, demographics affected seven later variables, but did not affect impairment. Trauma type affected ten later variables, but did not affect impairment. Traumatic response affected seven later variables, and did not affect impairment, except for personal physical injury predicting fun and/or leisure activity interference. Otherwise, posttraumatic symptoms were the only variables affecting later impairment and did so considerably with twenty associations. Quantitative findings were congruent with qualitative findings.

Discussion: Along the time series of PTSD, there is a tendency for factors to affect those variables that are adjacent or proximal, but not to affect those variables that are more distant or further out.

Keywords: trauma, anxiety, dysphoria, defensiveness, dissociation, dysregulation, disinhibition, sleep, disturbance, somatization, impairment

Introduction

Studies show that psychological trauma is often followed by anxiety disorders and depressive disorders at least as often, if not more often, than trauma- and stress-related disorders. Traumas are cumulative in leading to posttraumatic symptoms. Sometimes a more severe trauma earlier in life will not be followed by a full spectrum of posttraumatic stress disorder (PTSD) symptoms, while a less severe trauma later in life may be followed by a full spectrum of PTSD symptoms. Reports throughout modern history show that psychological trauma manifestations include anxiety, dysphoria, dysregulation, dissociation, disrupted sleep, defensiveness, and somatization. These findings, with the exception of somatization, are currently represented in Diagnostic and Statistical Manual of Mental Disorders-5-Text Revision (DSM-5-TR) PTSD diagnostic criteria. From a time series perspective, demographics precede the trauma, which immediately precedes its response, which precedes posttraumatic symptoms, which generally precede psychological

The manifestations following traumatic stress that have been observed throughout modern history fall into seven categories, including (1) anxiety (eg, dizziness, dyspnea, fear, jumpiness, panic, nervousness, shakiness, and tachycardia), (2) defensiveness (eg, conversion phenomenon, isolation, mutism, and paralysis), (3) dissociation (eg, mental confusion), (4) disturbed sleep (eg, sleeplessness and sleep problems), (5) dysphoria (eg, despair, homesickness, moral pain, and sadness), (6) dysregulation (eg, inactivity and disengagement), and (7) somatization (eg, headache, lethargy, listlessness, and stupor) (Table 1).¹⁻⁷ Following the Vietnam War, in response to social movements, political advocacy, and support groups, PTSD was recognized by the American Psychiatric Association (APA) in 1980 as a mental disorder.⁷ Over the decades, various features of the condition under consideration have been added and/or removed.⁸ In the

Diagnostic Term	Timeframe	Originator	Explanation/Victim	Manifestations	Reference
Nostalgia	1688 1761	Johannes Hofer (physician) Josef Leopold Auenbrugger (physician)	Associated with forced separation from family, friends, and social environment of Swiss mercenaries fighting for a French king trauma-stricken soldiers	Anxiety despair homesickness inactivity isolation lethargy listlessness moral pain sadness sleeplessness	Fuentenebro de Diego 2014 HISTORY.COM EDITORS 2023 www.ptsd.va.gov/ 2024
Soldier's Heart	1861-1865 (US Civil War)	Jacob Mendez Da Costa (physician)	Overstimulation of nervous system innervating the heart	Anxiety dyspnea tachycardia	www.ptsd.va.gov/ 2024
Shell Shock	1914-1918 (WWI)	Charles Myers	Brain hidden damage caused by big gun impact and artillery shell explosions	Panic sleep problems other	www.ptsd.va.gov/ 2024
War Neurosis	1918 1939	John T MacCurdy Frederick Dillon	anxiety psychosomatic manifestations	Anxiety conversion phenomenon dizziness fear headache jumpiness mental confusion mutism nervousness paralysis shakiness stupor	Kennedy 2020 Dillon 1939
Inadequate Personality	Early-Mid 1900s	Various texts	Characterlogical	difficulty adjusting to demands	McFarlane 2015

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Table 1 (Continued).

Diagnostic Term	Timeframe	Originator	Explanation/Victim	Manifestations	Reference
<i>Lack of Moral Fibre</i>	1940	Charles Symons (Chaplain-General)	British Armed Forces	this was a putative designation for psychological casualties used by the Royal Air Force during WWII for airman who refused to participate in flying operations	Jones 2002
Battle Fatigue (Combat Stress Reaction)	1939-1945 (WWII)	term used by British and American physicians	described the psychological stress responses to combat	anger outbursts anxiety depression difficulty concentrating emotional numbness fatigue headaches indecisiveness irritability memory complaints racing heart sleep problems tremors	www.ptsd.va.gov/ 2024
Gross Stress Reaction	1952	DSM-I	traumatized individuals	deferred to text	www.ptsd.va.gov/ 2024
Adjustment Reaction to Adult Life	1968	DSM-II	traumatized individuals	deferred to text	www.ptsd.va.gov/ 2024
PTSD	1980	DSM-III	traumatized individuals	deferred to text	www.ptsd.va.gov/ 2024

Abbreviations: DSM, Diagnosis and Statistical Manual of Mental Disorders; PTSD, posttraumatic stress disorder; WWI, World War I; WWII, World War II;

transition from DSM-IV-TR to DSM-5, Criterion A2 was removed: “The person’s response involved intense fear, helplessness, or horror”.⁹ However, the requirement was removed, not because a response does not occur, but because potential responses are broader than fear, helplessness, or horror, and include anger, confusion, and numbness.^{10–13} Similarities are seen between some of the responses that were in DSM-IV-TR Criterion A2 and DSM-5 Criterion D, as the “negative alterations in cognitions and mood” criteria now include anger, fear, horror, and numbing phenomena. Criteria B were changed from re-experiencing phenomenon to intrusion phenomenon. Criteria C avoidant criteria and numbing criteria were split into Criteria C and Criteria D. Criteria C avoidant criteria remained similar. Criteria D negative alterations in cognitions and mood became a new and broadened set of criteria. Criteria D contains the new items “persistent, distorted cognitions about the cause or consequences of the traumatic event(s) that lead the individual to blame himself/herself or others” and “persistent negative emotional state (eg, fear, horror, anger, guilt, or shame)”. Also, in the transition from DSM-IV-TR to DSM-5, Criteria D became Criteria E and “reckless or self-destructive behavior” was added. Criterion H was added “the disturbance is not attributable to the physiological effects of a substance or another medical condition”. The effect of many of these changes was to decrease the diagnostic threshold for PTSD, as DSM-IV-TR had higher thresholds for arousal, avoidance, and numbing than DSM-5 (Table 2).¹⁴ There were no changes between DSM-5 and DSM-5-TR PTSD diagnostic criteria.

Table 2 Change from DSM-IV-TR to DSM-5-TR PTSD diagnostic criteria

	DSM-IV-TR PTSD diagnostic criteria		DSM-5-TR Posttraumatic Stress Disorder in adults, adolescents, and children older than 6 years. Note: For children 6 years and younger, see corresponding criteria in the DSM-5-TR.
A	The person has been exposed to a traumatic event in which both of the following were present:	A	Exposure to actual or threatened death, serious injury, or sexual violence in one (or more) of the following ways:
	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.		1. Directly experiencing the traumatic event(s).
			2. Witnessing, in person, the event(s) as it occurred to others.
			3. Learning that the traumatic event(s) occurred to a close family member or close friend. In cases of actual or threatened death of a family member or friend, the event(s) must have been violent or accidental.
			4. Experiencing repeated or extreme exposure to aversive details of the traumatic event(s) (e.g., first responders collecting human remains; police officers repeatedly exposed to details of child abuse). Note: Criterion A4 does not apply to exposure through electronic media, television, movies, or pictures, unless this exposure is work related.
	2. The person's response involved intense fear, helplessness, or horror.		
B	The traumatic event is persistently reexperienced in one (or more) of the following ways:	B	Presence of one (or more) of the following intrusion symptoms associated with the traumatic event(s), beginning after the traumatic event(s) occurred:
	1. Recurrent and intrusive distressing recollections of the event, including images, thoughts, or perceptions.		1. Recurrent, involuntary, and intrusive distressing memories of the traumatic event(s).
	2. Recurrent distressing dreams of the event.		2. Recurrent distressing dreams in which the content and/or affect of the dream are related to the traumatic event(s).
	3. 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).		3. Dissociative reactions (e.g., flashbacks) in which the individual feels or acts as if the traumatic event(s) were recurring. (Such reactions may occur on a continuum, with the most extreme expression being a complete loss of awareness of present surroundings.)
	4. Intense psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event.		4. Intense or prolonged psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event(s).
	5. Physiological reactivity on exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event.		5. Marked physiological reactions to internal or external cues that symbolize or resemble an aspect of the traumatic event(s).

(Continued)

Table 2 (Continued).

DSM-IV-TR PTSD diagnostic criteria		DSM-5-TR Posttraumatic Stress Disorder in adults, adolescents, and children older than 6 years. Note: For children 6 years and younger, see corresponding criteria in the DSM-5-TR.	
C	Persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness (not present before the trauma), as indicated by three (or more) of the following:	C	Persistent avoidance of stimuli associated with the traumatic event(s), beginning after the traumatic event(s) occurred, as evidenced by one or both of the following:
	1. Efforts to avoid thoughts, feelings, or conversations associated with the trauma.		1. Avoidance of or efforts to avoid distressing memories, thoughts, or feelings about or closely associated with the traumatic event(s).
	2. Efforts to avoid activities, places, or people that arouse recollections of the trauma.		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).
		D	Negative alterations in cognitions and mood associated with the traumatic event(s), beginning or worsening after the traumatic event(s) occurred, as evidenced by two (or more) of the following:
	3. Inability to recall an important aspect of the trauma.		1. 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).
	4. Markedly diminished interest or participation in significant activities.		5. Markedly diminished interest or participation in significant activities.
	5. Feeling of detachment or estrangement from others.		6. Feelings of detachment or estrangement from others.
	6. Restricted range of affect (e.g., unable to have loving feelings).		7. Persistent inability to experience positive emotions (e.g., inability to experience happiness, satisfaction, or loving feelings).
	7. Sense of a foreshortened future (e.g., does not expect to have a career, marriage, children, or a normal lifespan).		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 completely dangerous", "My whole nervous system is permanently ruined").
			3. Persistent, distorted cognitions about the cause or consequences of the traumatic event(s) that lead the individual to blame himself/herself or others.
			4. Persistent negative emotional state (e.g., fear, horror, anger, guilt, or shame).
D	Persistent symptoms of increased arousal (not present before the trauma), as indicated by two (or more) of the following:	E	Marked alterations in arousal and reactivity associated with the traumatic event(s), beginning or worsening after the traumatic event(s) occurred, as evidenced by two (or more) of the following:
	1. Difficulty falling or staying asleep.		6. Sleep disturbance (e.g., difficulty falling or staying asleep or restless sleep).
	2. Irritability or outbursts of anger.		1. Irritable behavior and angry outbursts (with little or no provocation) typically expressed as verbal or physical aggression toward people or objects.
	3. Difficulty concentrating.		5. Problems with concentration.
	4. Hypervigilance.		3. Hypervigilance.

(Continued)

Table 2 (Continued).

	DSM-IV-TR PTSD diagnostic criteria		DSM-5-TR Posttraumatic Stress Disorder in adults, adolescents, and children older than 6 years. Note: For children 6 years and younger, see corresponding criteria in the DSM-5-TR.
	5. Exaggerated startle response.		4. Exaggerated startle response.
			2. Reckless or self-destructive behavior.
E	Duration of the disturbance (symptoms in Criteria B, C, and D) is more than 1 month.	F	Duration of the disturbance (Criteria B, C, D, and E) is more than 1 month.
F	The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.	G	The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.
		H	The disturbance is not attributable to the physiological effects of a substance (e.g., medication, alcohol) or another medical condition.

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Abbreviations: DSM, Diagnosis and Statistical Manual of Mental Disorders.

Box 1 Manifestations of PTSD

1. Anxiety – Psychic anxiety - psychological distress at exposure to cues that resemble or symbolize the trauma. Somatic anxiety - physiological reactions to cues that resemble or symbolize the trauma.
2. Defensiveness - avoidance of internal or external reminders or stimuli associated with the trauma.
3. Dissociation – intruding &/or re-experiencing memories, nightmares, &/or flashbacks related to the trauma.
4. Disturbed sleep – insomnia associated with the trauma.
5. Dysphoria - negative alterations in cognitions and mood associated with the trauma - (a.) anhedonia, (b.) decreased interest &/or participation in activities, (c.) memory problems, (d.) negative emotional state, (e.) nihilism, (f.) self-blame, and (g.) social isolation.
6. Dysregulation – hyperarousal &/or hyperreactivity associated with the trauma – (a.) anger, (b.) difficulty concentrating, (c.) hypervigilance, (d.) increased startle response, (e.) irritability, (f.) recklessness, (g.) restlessness, and (h.) self-destructiveness.
7. Somatization – eg, chronic pain, fatigue, &/or functional bowel symptoms (not DSM-5 criteria).

Table 3 Common Screens and Scales for PTSD

Clinician-Administered PTSD Scale for DSM-5 (CAPS-5)	Structured Interview	Clinician Administered
Impact of Event Scale - Revised (IES-R)	PTSD measurement	Self-report
Mississippi Scale for Combat-Related PTSD (M-PTSD)	PTSD measurement	Self-report
PTSD Checklist for DSM-5 (PCL-5)	PTSD measurement	Self-report
PTSD Symptom Scale - Interview for DSM-5 (PSS-I-5)	Structured interview	Clinician administered
Primary Care PTSD Screen for DSM-5 (PC-PTSD-5)	PTSD screen	Self-report (0-3 negative and 4-5 positive)
Brief Trauma Questionnaire (BTQ)	Trauma and stressor exposure	Self-report questionnaire
Combat Exposure Scale (CES)	Trauma and stressor exposure	Self-report questionnaire

Cross-Sectional Expanse of PTSD Symptoms

The manifestations following traumatic stress that have been observed throughout modern history continue to remain relatively common, including (1) anxiety, (2) defensiveness, (3) dissociation, (4) disturbed sleep, (5) dysphoria, (6)

dysregulation, and (7) somatization. DSM-5 lists PTSD nosologically separate from anxiety, personality, dissociative, sleep, depressive, bipolar, obsessive-compulsive, and somatic disorders, although it often shares similarities or overlaps with each of these (Box 1). DSM-5 appropriately constructs precise criteria for the manifestations associated with and following the traumatic event. Common screens and scales for PTSD used clinically and in research include those listed in Table 3.¹⁵

Overlap Between Anxiety, Depression, PTSD, and Other Conditions

There is considerable overlap between PTSD and (i) Anxiety Disorders (anxiety), (ii) Sexual Dysfunctions (defensiveness), (iii) Dissociative Disorders (dissociation), (iv) Sleep-Wake Disorders (disturbed sleep), (v) Depressive Disorders (dysphoria), (vi) Bipolar Disorders and Obsessive-Compulsive Disorders (dysregulation), and (vii) Somatic Disorders (somatization). Avoidance is a defense mechanism in PTSD,¹⁶ and the PTSD symptom cluster of avoidance is commonly associated with sexual desire problems and sexual difficulties.^{17–19} Emotional dysregulation is a key component of PTSD

Table 4 Descriptions and Manifestations of Anxiety and Depression

	HAM-A (Anxiety)	HAM-D (Depression)
1	General - burning sensations, hot and cold flushes Skin - diaphoresis, flushing, pallor, piloerection HEENT – furrowed brow, strained face, exophthalmos, blurred vision, mydriasis, tinnitus, bruxism, dry mouth Neck, Musculoskeletal, and Extremities – aches and pains, increased muscle tone, stiffness (DSM-5 - muscle tension) Neurological – giddiness, hyperreflexia, myoclonic jerks, paresthesia, tension headache, trembling, tremor, twitching, unsteady voice	General Somatic Symptoms General - bodily self-absorbed, hypochondriasis, preoccupation with health, somatization Skin – no specific manifestations HEENT – no specific manifestations Neck, Musculoskeletal, and Extremities – backache, heaviness in head, back, or limbs, tension Neurological – headaches
2	Dyspnea, tachypnea	Respiratory Somatic Symptoms
3	Chest pain, pressure, or tightness, palpitations, tachycardia, throbbing of vessels	Cardiovascular Somatic Symptoms – palpitations
4	Abdominal fullness and/or pain, belching, borborygmi, constipation, dysphagia, loose stools, nausea, vomiting, wind	Gastro-Intestinal Somatic Symptoms – constipation, heaviness in abdomen, indigestion, loss of appetite
5	Amenorrhea, decreased libido, impotence, menorrhagia, premature ejaculation, urinary frequency, urinary urgency	Genito-Urinary (and Reproductive) Somatic Symptoms - loss of libido, menstrual disturbances
6	Dysphoria, diurnal mood swing, tearfulness	Dysphoria,* diurnal mood variation, weepiness (DSM-5 also includes emptiness, hopelessness, sadness, and/or tearfulness)
7	Anticipation of the worst	Nihilism, gloom and doom, pessimism
8	Sighing [as an expression of sadness or boredom]	Apathy
9	Irritability*	Irritability, moodiness
10	Insomnia (initial, middle, or terminal) * (DSM-5 also includes restless [interrupted] sleep and unsatisfying [nonrestorative] sleep)	Insomnia (initial, middle, or terminal) * (DSM-5 also includes hypersomnolence)
11	Weight loss	Weight loss* (DSM-5 also includes weight gain)
12	Fatigue*	Fatigue* (DSM-5 also includes loss of energy)
13	Feeling choked, faint, or weak	Listlessness or stupor
14	Difficulty concentrating,* poor memory (DSM-5 - mind going blank)	Feelings of indecisiveness* (DSM-5 also includes diminished ability to think or concentrate)

(Continued)

Table 4 (Continued).

	HAM-A (Anxiety)	HAM-D (Depression)
15	Anhedonia, loss of interest	Loss of interest in activities and hobbies (DSM-5 - diminished interest or pleasure in activities)
16	Fidgetiness, inability to relax, pacing, restlessness*	Psychomotor agitation,* restlessness
17	Anxiety* (DSM-5 also includes feeling keyed up or on edge)	Anxiety (including psychoform anxiety and somatoform anxiety)
18	Worry*	Worrying
19	Fear of animals, being left alone, crowds, dark, future, strangers, or traffic	Fearfulness
20	Increased startle	
21	Dreams, nightmares, and night-terrors	
22		Psychomotor retardation,* slowness of activity, speech, or thought
23		Feelings of guilt, feels he or she has let people down, self-reproach (DSM-5 - feelings of worthlessness and/or feelings of guilt)
24		Feels life is not worth living, thoughts about death and/or dying, suicidality (DSM-5 - recurrent thoughts of death and/or dying, including suicidal behavior)
25		Abnormal behavior – compulsions
26		Abnormal interpersonal interactions - apprehensiveness, suspiciousness, paranoia,
27		Abnormal thoughts – obsessions, ideas of reference, delusions,
28		Abnormal perceptions - hallucinations
29		Abnormal defenses - feelings of unreality, depersonalization, derealization
30		Limited insight, considers his or her present illness as a punishment
31		Abnormal impairment - feelings of incapacity, decreased socialization, decreased productivity and/or interference with work
	*Finding in both HAM A and DSM-5 GAD	*Finding in both HAM D and DSM-5 MDD

Notes: blue hue = mood, feelings, sleep, and weight manifestations common to both anxiety and depression. green hue = energy, concentration, and interest changes common to both anxiety and depression. yellow hue = agitation, anxiety, fear, and worry findings in anxiety and/or depression. orange hue = self-reproach, thoughts about death and dying, and psychomotor retardation seen with depression. red hue = other findings seen with depression. purple hue = somatic manifestations common to both anxiety and depression

Abbreviations: DSM-5, Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition; GAD, Generalized Anxiety Disorder; HAM A, Hamilton Anxiety Rating Scale; HAM D, Hamilton Depression Rating Scale; MDD, Major Depressive Disorder.

and a risk factor for developing and maintaining PTSD,^{20,21} emotional dysregulation is correlated with mood symptoms in bipolar disorder²² and nonacceptance of emotions in OCD.^{23–25}

The International Classification of Diseases, Tenth Revision (ICD-10), includes mixed anxiety and depressive disorder (MADD) as a codable diagnosis, and the DSM-5 alludes to the existence of MADD symptom criteria on

Table 5 Findings of Anxiety, Depression, and Posttraumatic Stress Disorder. Italicized Items are Relatively Common, but Not Specifically Listed in HAM A, HAM D, or DSM-5

	GAD (or Panic and Other Forms of Anxiety)	MDD	PTSD
1	Worrying about health, death, and/or dying*	Recurrent thoughts about death and/or dying* **	Distressing memories of a traumatic event involving death and/or dying*
2	Subjective memory complaints**	<i>Subjective memory complaints</i>	Inability to remember an important aspect of a traumatic event*
3	Anhedonia** Decreased libido**	Anhedonia* Diminished pleasure in activities*	Persistent inability to experience positive emotions*
4	Loss of interest**	Decreased participation in activities (eg, music concerts and sporting events) due to diminished enthusiasm**	Avoidance of people, places, activities, or situations* Diminished interest in activities* Diminished participation in activities*
5	Mind going blank*	Diminished ability to think* Indecisiveness*	Avoidance of memories of a traumatic event*
6	Fatigue*	Fatigue or loss of energy* **	Feelings of detachment or estrangement from others*
7	<i>Low self-esteem or guilt related to anxiety</i>	Feelings of worthlessness or feelings of guilt* **	Negative beliefs or expectations about oneself* Distorted cognitions about the cause or consequences of a traumatic event that lead the individual to blame himself or herself*
8	Dysphoria, diurnal mood swing, anticipation of the worst, and tearfulness**	Dysphoria* ** (includes emptiness, hopelessness, sadness, and tearfulness in DSM-5)	Persistent negative emotional state*
9	Insomnia, interrupted sleep, and nonrestorative sleep*	Change in sleep (eg, insomnia or hypersomnia)* **	Sleep disturbance*
10	Fidgetiness, irritability, pacing, and restlessness* **	Psychomotor agitation* ** Psychomotor retardation* **	Anger and/or irritability* Restlessness*
11	Difficulty concentrating*	Diminished ability to concentrate* ** Indecisiveness* **	Problems with concentration*
12	<i>Suicidal behavior associated with panic</i>	Suicide attempt or self-injurious behavior* **	Recklessness or self-destructive behavior*
13	Weight loss*	Change in weight (eg, weight loss or weight gain)* **	<i>Weight gain associated with age-related decreased basal metabolic rate and decreased physical activity without accompanying decreased caloric intake</i>
14	Feeling keyed up or on edge*	<i>Hypercortisolism</i>	Hypervigilance*
15	<i>Anxiety is directly correlated with depersonalization and derealization.</i>	<i>Depersonalization and/or derealization affect approximately 50% of individuals with depression.</i>	Dissociative reactions in which the individual feels or acts as if a traumatic event was recurring*
16	Anxiety, giddiness, and inability to relax* **		Psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of a traumatic event*
17	Chest pain, pressure, or tightness, diaphoresis, dyspnea, feeling choked, faint, or weak, muscle tension, palpitations, tachycardia, tachypnea, and/or throbbing of vessels* **		Physiological reactions to internal or external cues that symbolize or resemble an aspect of a traumatic event
18	Increased startle**		Exaggerated startle response*
19	Dreams, nightmares, and night-terrors**		Recurrent distressing dreams in which the content and/or affect of the dream are related to a traumatic event*

(Continued)

Table 5 (Continued).

	GAD (or Panic and Other Forms of Anxiety)	MDD	PTSD
	*Findings listed in DSM-5 Generalized Anxiety Disorder **Findings listed in Hamilton Anxiety Rating Scale	*Findings listed in DSM-5 Major Depressive Disorder **Findings listed in Hamilton Depression Rating Scale	*Findings listed in DSM-5 Posttraumatic Stress Disorder

Notes: odd numbered rows, gray. even numbered rows, white.

Abbreviations: DSM-5, Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition; GAD, Generalized Anxiety Disorder; HAM A, Hamilton Anxiety Rating Scale; HAM D, Hamilton Depression Rating Scale; MDD, Major Depressive Disorder; PTSD, Posttraumatic Stress Disorder.

page 185. [Table 4](#) shows descriptions and manifestations of anxiety and depression, mostly as they appear in Hamilton Anxiety Rating Scale (HAM A), with DSM-5 correlates, and Hamilton Depression Rating Scale (HAM D), with DSM-5 correlates. Of 31 common findings due to anxiety or depression, 19 (61.3%) are potentially shared between anxiety and depression, 2 (6.5%) are attributed to only anxiety, and 10 (32.3%) are attributed to only depression. Hence, anxiety and depression might have many more manifestations in common than they have different. Moreover, studies find very high correlations between HAM A and HAM D.^{26,27} Similarly, [Table 5](#) shows descriptions and manifestations of anxiety, depression, and PTSD, predominately corresponding to DSM-5 PTSD criteria. Of 19 common findings due to anxiety, depression, or PTSD, 19 (100%) have the potential of being shared between anxiety and PTSD, and 15 (78.9%) have the potential of being shared between anxiety, depression, and PTSD, mostly based on DSM-5 criteria, HAM A, and HAM D. Hence, there is considerable overlap between anxiety, depression, and PTSD symptomatology. Moreover, overlap syndromes exist between anxiety, depression, and PTSD.^{28,29} It is beyond the scope of this paper to discuss all the evidence supporting the overlap between Generalized Anxiety Disorder (GAD), Major Depressive Disorder (MDD), and PTSD. Nonetheless, the cardinal finding in PTSD is intrusiveness (or re-experiencing) phenomenon.³⁰ If intrusiveness is

Table 6 Prevalences of Anxiety Disorder(s), Depressive Disorder(s), and PTSD Following trauma^{37–79}

No.	Author	Year	Age Group Children and/or Adolescents Adults	Type of Trauma	Anxiety Prevalence Following the Trauma	Depression Prevalence Following the Trauma	PTSD Prevalence Following the Trauma
1	Bond	2017	Adults	Close relative of burn survivor	9-32%	3-21%	3-13%
2	Hatch	2018	Adults	Critical or serious illness	46%	40%	22%
3	Calsavara	2021	Adults	Critical or serious illness	67%	49%	46%
4	Li	2021	Adults	Epidemic or Pandemic	22.1%	21.7%	21.5%
5	Futerman ^a	2023	Pregnant or nursing mothers	Epidemic or Pandemic	48.2%	27.3%	22.9%
6	Kaputu-Kalala-Malu	2021	Adults	Epidemic or Pandemic	33.3%	24.3%	24.3%
7	Pasha	2023	Adults	Epidemic or Pandemic	62.2%	61.0%	40.3%
8	Palinkas	1993	Adults	Manmade Disaster	20.2%	14.2–16.6%	9.4%

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Table 6 (Continued).

No.	Author	Year	Age Group Children and/or Adolescents Adults	Type of Trauma	Anxiety Prevalence Following the Trauma	Depression Prevalence Following the Trauma	PTSD Prevalence Following the Trauma
9	Williamson	2023	Treatment-seeking veterans	Military Service	80.7% ^c	80.7% ^c	68.7%
10	Nichter ^b	2022	Male veterans	Military Sexual Trauma	30.7%	27.3%	25.4%
11	Fan	2011	Children and/or adolescents	Natural Disaster	40.5%	24.5%	15.8%
12	Karam	2014	Children and adolescents	War - Middle East	5.6%	4.2%	1.4%
13	Bah	2020	Adults	Epidemic or Pandemic	24.9%	47.2%	21.8%
14	Chen	2021	Adults and Older Adolescents	Epidemic or Pandemic	16.4%	21.0%	13.2%
15	Chen	2023	Young Adults	Epidemic or Pandemic	12.7%	25.8%	7.9%
16	Ouazzani	2023	Adults	Epidemic or Pandemic	29.2%	31.5%	21.7%
17	Damico	2021	Adults	Epidemic or Pandemic	25.6%	44.2%	23.2%
18	Finnegan	2023	Veterans	Military Service	15.0%	17.8%	3.4%
19	Futterman ^a	2023	Pregnant or nursing mothers	Natural Disaster	17.4%	22.5%	8.2%
20	Nobels	2023	Elderly	Sexual Violence	33%	34%	9%
21	Spikol	2022	Veterans	Various trauma types	35.0%	42.2%	29.1%
22	Yaow	2022	Adults	Critical or serious illness	26.0%	19.0%	20.0%
23	Liu	2019	Adults	Critical or serious illness	50%	46.7%	47.5%
24	Georgieva	2021	Adults	Epidemic or Pandemic	~11.4% ^d	9.3% ^d	11.4% ^d
25	Maalouf	2022	Children and adolescents	Manmade disaster	64%	33%	52%
26	Rzońca	2024	Healthcare workers	War zone proximity	12.6%	9.0%	12.2% ± 2.3%
27	Wiseman	2015	Adults	Acute illness or injury – ED patient – traumatic injury	22.0% - 34.4%	23.9% - 40.2%	22.9% - 36.9%
28	Matthews	2022	Adults	Acute illness or injury - ED patient	9.29%	24.8%	10.47%
29	Kukihara	2014	Adults	Manmade disaster	Not reported	66.8%	32.2%
30	Nichter	2019	Veterans	Military Service	Not reported ^e	8.2%	5.1%

(Continued)

Table 6 (Continued).

No.	Author	Year	Age Group Children and/or Adolescents Adults	Type of Trauma	Anxiety Prevalence Following the Trauma	Depression Prevalence Following the Trauma	PTSD Prevalence Following the Trauma
31	Fortney	2016	Veterans	Military Service	23.1%	33.1%	25.7%
32	Ying	2013	Children and/or adolescents	Natural Disaster	Not Reported	42.5%	8.6%
33	Guo	2017	Adults and older adolescents	Manmade disaster	Not reported	66.8%	32.2%
34	Guo	2017	Adults and older adolescents	Natural Disaster	Not Reported	24.8%	11.8%
35	Fan	2017	Adolescents	Natural Disaster	Not Reported	38.3% - 41.0%	14.0% - 22.5%
36	Bourmistrova	2022	Adults	Epidemic or Pandemic	17.5%	18.9–20.4%	17.7–19.0%
37	Futterman ^a	2023	Pregnant or nursing mothers	Natural Disaster	Not Reported	38.8%	22.4%
38	Aslan	2023	Young Adults	Epidemic or Pandemic	36.2	55.0	61.2%
39	Cao	2022	Adolescents	Epidemic or Pandemic	7.1%	12.8%	16.9%
40	Al-Saadi	2022	Children and/or Adolescents	Critical or serious illness	13.92%	20.43%	20.90%
41	Baralla	2021	Migrant Adults	Severe psychological abuse, severe physical abuse, sexual violence (eg, rape) and/or torture	7.1% ^f	22.5% ^f	30.2% ^f
42	Ikin	2010	Veterans	War	Not Reported ^g	23.0%	32.1%
43	Bruggimann	2006	Nonelderly adults	Acute illness or injury – non-severe stroke	24%	6 - 10%	31%
44	Hill	2022	Healthcare Workers	Epidemic or Pandemic	16.1%	13.4%	21.7%
45	Nichter ^b	2022	Female veterans	Military Sexual Trauma	16.2%	13.9%	26.7%
46	Taha	2020	Kurdish Females	Terrorists' Hostages	37.4%	36.7%	90.6%

Notes: ^aFindings reported at three different times. ^bFindings reported for males and females. ^cClinically significant anxiety and/or depression; ^dnew incidence; ^eGeneralized anxiety disorder and social anxiety disorder occurred comorbidly with MDD and PTSD; ^fincludes various anxiety-, mood-, and trauma-related disorders; and ^gthe authors suggested that anxious misery is the antecedent of depression and PTSD, thereby holding them together. purple hue anxiety prevalence > depression prevalence > PTSD prevalence. blue hue anxiety prevalence > PTSD prevalence > depression prevalence. green hue depression prevalence > PTSD prevalence > anxiety prevalence. yellow hue PTSD prevalence > anxiety prevalence > depression prevalence. orange hue PTSD prevalence > depression prevalence > anxiety prevalence. On August 28, 2024, three PubMed literature searches were performed: first, “anxiety”, “depression”, and “PTSD” as search terms in titles and/or abstracts, reviewing the top 40 best match articles; second, “anxiety”, “depression”, “PTSD”, and “injury OR violence OR sexual OR assault OR battery”, reviewing the top 40 “best match” articles; and third “anxiety”, “depression”, “PTSD”, and “servicemember OR veteran OR combat”, reviewing the top 30 “best match” articles.

minimal or absent, then it becomes important to consider other mental disorders in the differential diagnosis. Attributing an identified finding to a specific disorder may be misplaced, related to experience, motivation, perception, and other factors. Awareness of these may be helpful to decrease bias.³¹

Anxiety Disorders, Depressive Disorders, and PTSD Following Traumatic Stress

Anxiety disorders (eg, agoraphobia, GAD, panic disorder, and social anxiety disorder (SAD)), obsessive-compulsive and related disorders (eg, Obsessive Compulsive Disorder (OCD)), depressive disorders (eg, MDD), and bipolar and related disorders (eg, Bipolar Disorder Type I (BPD I)) commonly occur comorbidly with PTSD.^{29,32–36} A brief sampling from the literature finds that an anxiety disorder and/or a depressive disorder might be at least as likely as PTSD, if not more likely than PTSD, to occur following a traumatic event (Table 6).^{37–79} This was the case for 37/46 (80.4%) reports sampled (single observation). The longer the time between the trauma and the assessments, the lower the prevalences of anxiety, depression, and PTSD.⁷¹ The longer the distance between the event and the individual, the lower the prevalences of anxiety, depression, and PTSD.⁸⁰ Older individuals are more likely to show symptoms of anxiety and/or depression, while younger individuals are more likely to show symptoms of PTSD.⁵³ Following a traumatic stress, anxiety sensitivity and emotional dysregulation underlie many of the manifestations of PTSD.^{81–83} Defense mechanisms (eg, avoidance, denial, dissociation, and repression) mediate the path between trauma and distress.^{84–86} Sleep disturbances are highly prevalent following traumatic stress.⁷¹ Among traumatic stress victims, anxiety, depression, dissociation, and sleep disturbances are associated with PTSD.^{70,87} Among military veterans, anxiety, depression, somatization, substance use, and suicidality significantly correlate with PTSD.^{56,88–90} Hence, when traumatic stress occurs, one might expect anxiety disorder and/or depressive disorder emergence at least as likely as trauma- or stressor-related disorder emergence.

Psychological Traumatic Stressors and Potential Responses

Box 2 lists psychological traumatic stressors and potential responses. When traumatic stress occurs, psychological responses may be focal (eg, intrusiveness) or generalized (eg, intrusiveness with avoidance, negative cognitions and mood, and hyperarousal), short duration or long duration, infrequent or frequent, low intensity or high intensity, and nonpervasive or pervasive. Some authors have concluded that PTSD is not a monolithic disorder characterized by specific and consistent mental traits.⁹¹ There is a cumulative factor – that is, often previous traumas kindle the psyche for increased manifestations as responses to subsequent traumas.^{32,67,69,92,93} The consequences of traumatic stress lead to variable degrees of impairment, from none to severe. Most, if not all, studies show that only a minority of individuals, who are exposed to traumatic stress, develop PTSD,^{94–98} and most studies show that of those who develop PTSD, the natural history is remission over time.⁹⁹ The type of trauma is a factor in both the development and the maintenance of PTSD, with accidents and natural disasters having lower risk, military combat as medium risk, and personal sexual assault as higher risk.^{97,100–104} Checklists do not establish the PTSD diagnosis. DSM-5-TR requires a connection between the trauma and the symptoms, with specified durations (persistent or prolonged), frequencies (recurrent), intensities (marked or pronounced), abnormalities (distorted, exaggerated, or involuntary), and negative effects (distressing or impairing) for the diagnosis.

Box 2 Psychological Traumatic Stressors and Potential Responses

- | |
|---|
| <ul style="list-style-type: none"> • Civil unrest, terrorism, or war zone • Epidemic or pandemic • Illness or injury (eg, self was physically injured or someone else was physically injured) • Manmade disaster (accidents, explosions, fires, hazardous material breaches) • Natural disaster (earthquakes, floods, hurricanes, tornados) • Personal assault, battery, or imprisonment • Other |
| <ul style="list-style-type: none"> • Fear (eg, thinking that one's life was in danger or thinking that another's life was in danger) • Helplessness • Horror (eg, feeling terrified) • Anger • Confusion • Numbness |

Box 3 Intermediate Factors Increasing and Decreasing Posttraumatic Symptoms

Mediatory factors increasing posttraumatic symptoms
1. Anger about memories of trauma
2. Anxiety sensitivity
3. Disability seeking
4. Dissociation
5. Emotional dysregulation
6. Emotional suppression
7. Entrapment
8. Interpretations (negative thoughts about memories of trauma)
9. Locus of control (blaming others)
10. Negative affectivity
11. Negative thinking
12. Ruminations (intrusiveness of memories of trauma)
13. Suppression (avoidance of memories of trauma)
14. Trauma centrality
Mediatory factors decreasing posttraumatic symptoms
1. Coping
2. Mindfulness
3. Perceived social support
4. Resilience
5. Subjective cognitive ability

PTSD “Phenotype” and Time Series Illustration

The term “phenotype” refers to the observable physical properties of an organism, including appearance, behavior, constitution, and development, which is determined by the interaction between the genotype and the environment.^{105,106} There is a gene-environment interaction in the phenotypic development of PTSD. Gene-environment factors occur, including (1) premorbid characteristics, (2) trauma factors, (3) immediate psychological experience or response, (4) short-term posttraumatic phase (three months or less), (5) long-term posttraumatic phase (more than three months), (6) posttraumatic manifestations (linked to the trauma), and (7) impairment (linked to the posttraumatic manifestations that are linked to the trauma). The human element is superimposed on the gene-environment interaction and includes experience, motivation, perception, and transcendence. We suspect that each of these factors might be involved in the PTSD course.

A time series is a sequence of data points that occur in successive order over some period of time.¹⁰⁷ A time series for PTSD includes (1) premorbid characteristics (eg, demographics), (2) trauma factors (eg, trauma type), (3) immediate psychological experience or response (eg, traumatic response), (4) posttraumatic manifestations (eg, posttraumatic symptoms), including short-term posttraumatic phase (eg, three months or less following the trauma) and long-term posttraumatic phase (eg, more than three months following the trauma), and (5) impairment (eg, subjective interference areas). Trauma connects or strings to several *intermediate factors* that connect or string to posttraumatic symptoms. *Intermediate factors* increasing and decreasing posttraumatic symptoms are shown in **Box 3**.

Demographics – PTSD

In adults who have experienced trauma, many studies show that younger age,¹⁰⁸ non-Caucasian race,^{109,110} nonmarried,¹¹⁰ female gender,^{101,110} lower levels of education,¹¹¹ and unemployment¹¹⁰ increase the odds or risks for developing PTSD. Caucasians are more likely to experience combat than non-Caucasians (Armey 2021),¹⁰⁹ but Caucasians represent a greater proportion of the population than non-Caucasians.¹¹² Of the US population, 61.6% are Caucasian and 38.4% are non-Caucasian.¹¹² In 2010, non-Hispanic Caucasians comprised 63.8% of the US population.¹¹³ During Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF), the percentage of non-

Hispanic Caucasians participating in combat was essentially identical (63.7%).¹¹⁴ In 2010, Hispanics, African Americans, and Asian Americans comprised 33.5 of the US population.¹¹³ During OIF and OEF, the percentage of Hispanics, African Americans, and Asian Americans participating in combat was similar (36.3%).¹¹⁴ Some studies show Caucasians are more likely than non-Caucasians to seek treatment for PTSD,^{115–118} while other studies show the opposite.¹⁰⁹

Trauma Type, Duration, Frequency, and Intensity – PTSD

Many studies show that trauma factors, including trauma type,^{93,119,120} trauma duration,^{111,121–123} trauma frequency,^{124–126} and trauma intensity^{101,104,124,127–129} are associated with PTSD.

Traumatic Response – PTSD

Many studies show that which the traumatized victim felt or thought during the time of the trauma is associated with PTSD.^{67,130–134} DSM-IV-TR referred to this as the traumatic response. Traumatic response might include feelings such as fear, helplessness, or horror, included in DSM-IV-TR, or feelings of anger, confusion, or numbness, not included in DSM-IV-TR.^{10–13} The PTSD symptom scale (PSS) assesses (a) fear (Did you think your life was in danger? Did you think someone else's life was in danger?) (assuming congruence between thoughts and feelings), (b) helplessness (Did you feel helpless?), (c) horror (Did you feel terrified?) (assuming congruence between reaction and feelings), and (d) circumstance (Were you physically injured? Was someone else physically injured?).¹³⁵

PTSD – Impairment

Less is known about factors that are linked to impairment. Studies show that psychological and social factors occurring within the first three months of the trauma affect the odds or risks for developing PTSD,^{136,137} and unsettled compensation or litigation occurring more than three months past the trauma affect the odds or risks for maintaining PTSD.^{130,131} The study that follows is an exploratory qualitative and quantitative time series analysis of PTSD, from pretraumatic factors to trauma, and from trauma to posttraumatic impairment, with attempts to identify associations between such factors.

Methods

This cross-sectional pilot study seeks to illustrate a time-series analysis of PTSD, examining the following time points: demographics, trauma type, traumatic response, posttraumatic symptoms, and subjective impairment. The aims are twofold: (1) to determine the relationships between demographic variables, trauma variables, and posttraumatic variables in veterans with PTSD, and (2) to determine if such variables translate to subjective interference or impairment. The purposes of this pilot study are as follows: to gather qualitative and quantitative information inquiring about (A) the effects that demographics have on trauma type, traumatic response, posttraumatic symptoms, and subjective interference, (B) the effects that trauma type have on traumatic response, posttraumatic symptoms, and subjective interference, (C) the effects that traumatic response have on posttraumatic symptoms and subjective interference, and (D) the effects that posttraumatic symptoms have on subjective interference or impairment. Following traumatic stress, there may occur potentially broad manifestations, including anxiety, defensiveness, dissociation, disturbed sleep, dysphoria, dysregulation, and somatization. Therefore, we planned to assess potentially broad manifestations, including depression, insomnia, pain (intensity, number of locations, and total), physical health, PTSD symptoms, quality of life, and wellbeing. Wellbeing concerns an individual's emotional response to his or her illness, injury, or trauma. Quality of life is an individual's cognitive appraisal of his or her health and its impact on his or her life.¹³⁸

This is an exploratory qualitative and quantitative inquiry using cross-sectional pretreatment information in a dataset that was gathered on a Microsoft Excel spreadsheet in the study known as *Trauma Releasing Exercises (TRE) Involving Neurogenic Tremor Training as Adjunctive Treatment for PTSD: A Controlled Clinical Trial*, of which one of the authors (MK) was the Principal Investigator. Between 2015 and 2022, the study team collected 107,744 data elements (minus incomplete or missing data) on 112 veterans who volunteered at the Carl T. Hayden Veterans Administration Healthcare System (VAHCS) in Phoenix, AZ, with adherence to Department of Veterans Affairs policies and procedures. The data collected included demographics (age, race, gender, and education level), clinical history (medications and presence or absence of history of traumatic brain injury), service-connected disabilities, and psychometric testing performed before-

Table 7 Psychometric Tests, Abbreviation, and Assessment Item

Name	Abbreviation	Subjective Scale Assessing
Insomnia Severity Index	ISI	Sleep quality
McGill Pain Questionnaire	MPQ	Pain
Patient Health Questionnaire-9	PHQ-9	Depression
Patient Health Questionnaire – 15	PHQ-15	Somatization and somatic symptoms
PTSD Symptom Scale	PSS	PTSD symptoms
Ryff Scales	Ryff	Psychological wellbeing (PWB)
36-Item Short Form Health Survey	SF-36	Health-related quality of life (QOL)

Table 8 Variable Name and Type

		Independent Variable	Dependent Variable	Type of Variable
Demographics				
1	Age	X		Numeric – discrete
2	Caucasian Non-Caucasian	X		Categorical – nominal (binary)
3	Male Female	X		Categorical – nominal (binary)
4	Highest level of education (in years) – 12, 14, 16, 18, or 20	X		Numeric – discrete
Trauma type				
1	PSS personal assault (±)	X	X	Categorical – nominal (binary)
2	PSS combat, POW (or imprisonment), or torture (±)	X	X	Categorical – nominal (binary)
3	PSS accidents, illnesses, or natural phenomenon (±)	X	X	Categorical – nominal (binary)
4	PSS other (±)	X	X	Categorical – nominal (binary)
Number of different trauma types				
1	PSS trauma type (quantitatively)		X	Numeric –discrete (0, 1, 2, ...12)
Traumatic response				
1	PSS self was physically injured (±)	X	X	Categorical – nominal (binary)
2	PSS someone else was physically injured (±)	X	X	Categorical – nominal (binary)
3	PSS thought that one's own life was in danger (±)	X	X	Categorical – nominal (binary)
4	PSS thought that someone else's life was in danger (±)	X	X	Categorical – nominal (binary)
5	PSS personal feeling of helplessness (±)	X	X	Categorical – nominal (binary)
6	PSS personal feeling of being terrified (±)	X	X	Categorical – nominal (binary)

(Continued)

Table 8 (Continued).

		Independent Variable	Dependent Variable	Type of Variable
Number of different traumatic responses				
1	Traumatic response (quantitatively)		X	Numeric –discrete (0, 1, 2, ...6)
Posttraumatic symptoms				
1	ISI	X	X	Numeric –discrete (0–28)
2	MPQ total	X	X	Numeric –discrete (0–78)
3	MPQ VAS	X	X	Categorical – ordinal (0–5)
4	MPQ DN	X	X	Numeric – discrete
5	PHQ-9	X	X	Numeric –discrete (0–27)
6	PHQ-15	X	X	Numeric –discrete (0–30)
7	PSS symptom score	X	X	Numeric –discrete (0–51)
8	Ryff total score Recode negative phrased items # 3, 5, 10, 13, 14, 15, 16, 17, 18, 19, 23, 26, 27, 30, 31, 32, 34, 36, 39, 41. (ie, if the score is 6 on one of these items, the adjusted score is 1; if the score is 5 on one of these items, the adjusted score is 2, and so forth)	X	X	Numeric –discrete (42–252 w higher score indicating greater wellbeing)
9	^a SF-36 total score	X	X	Numeric –discrete (0–100 w higher score indicating better functioning)
Depression difficulty level				
1	PHQ-9 difficulty level If you checked off any problems, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?		X	CATEGORICAL – ordinal (0–3)
Subjective interference				
1	PSS family relationships, friendships, or sex life interference (±)		X	Categorical – nominal (binary)
2	PSS fun and/or leisure activities interference (±)		X	Categorical – nominal (binary)
3	PSS general life satisfaction or overall functioning interference (±)		X	Categorical – nominal (binary)
4	PSS household duties, schoolwork, or work interference (±)		X	Categorical – nominal (binary)
Number of different subjective interferences				
1	PSS trauma interference (quantitatively)		X	Numeric –discrete (0, 1, 2, ...9)

Notes: ^ahttps://www.rand.org/health-care/surveys_tools/mos/36-item-short-form/scoring.html. Gray rows indicate a quantitative difficulty level or a quantitative number of different responses.

Abbreviations: CNS, Central Nervous System; ISI, Insomnia Severity Index; MPQ, McGill Pain Questionnaire; VAS, visual analogue scale; DN, dot number; PHQ-9, Patient Health Questionnaire-9; PHQ-15, Patient Health Questionnaire-15; POW, Prisoner of War; PSS, PTSD Symptom Scale; PTSD, Posttraumatic Stress Disorder; SC, Service Connection; SF-36, Short Form-36; TBI, Traumatic Brain Injury.

and-after a non-pharmacologic clinical intervention aimed at decreasing symptoms in veterans with PTSD. Information regarding the psychometric tests that were performed is shown in Table 7. The validity and reliability of these scales for assessing the items of interest have previously been reported.^{135,139–144} Then the study team performed a cross-sectional assessment of the data collected prior to the intervention to achieve the aims of this study. Pretreatment PSS data was

Table 9 Type of Statistical Test Based on Type of Independent Variable and Type of Dependent Variable

Independent Variable	Dependent Variable	Statistical Test
Categorical – nominal (binary)	Categorical – nominal (binary)	Chi-square test (Fisher's exact test)
Categorical – nominal (binary)	Categorical – ordinal	Mann–Whitney <i>U</i> -test
Categorical – nominal (binary)	Numeric – discrete	Student's <i>t</i> -test
Numeric – discrete	Categorical – nominal (binary)	Student's <i>t</i> -test
Numeric – discrete	Categorical – ordinal	ANOVA
Numeric – discrete	Numeric – discrete	Pearson's correlation coefficients

missing for 29 study participants, and although posttreatment PSS data was available, it was not used for concern of confounding the results. Variable name and type are presented in Table 8. We use the term trauma type to refer to the situation (personal assault, combat, accidents, and so forth). We use the term traumatic response to refer to, at the time of the trauma, that which happened to self or other (self was injured or another was injured), that which the trauma victim thought (thought that one's life was in danger or thought that another's life was in danger), or that which the trauma victim felt (felt helpless or felt terrified). The statistical tests that were used are presented in Table 9. All statistical tests were performed using IBM Statistical Package for the Social Sciences (SPSS) software, Version 26. We compared the following: A. Demographics as an independent variable with (1) trauma type, (2) number of different trauma types, (3) traumatic response, (4) number of different traumatic responses, (5) posttraumatic symptoms, (6) depression-related difficulty, (7) subjective interference, and (8) number of different subjective interferences as dependent variables; B. Trauma type as an independent variable with (1) traumatic response, (2) posttraumatic symptoms, (3) subjective interference, (4) number of different trauma types, (5) number of different traumatic responses, (6) depression-related difficulty, and (7) number of different subjective interferences as dependent variables; C. Traumatic response as an

Table 10 Demographic Variable Frequency Distributions

1	Age (in Years)	Mean = 49.5, SD = 13.6, Range = 23–69
2	Race number (%)	63 (56.2%) Caucasian, 49 (43.8%) non-Caucasian Categories were determined to produce the most power for analyses involving race.
3	Gender number (%)	86 (76.8%) male, 26 (23.2%) female
4	Highest level of education (in years) number (%)	18 (16.1%) 12 years 37 (33.0%) 14 years 40 (35.7%) 16 years 10 (8.9%) 18 years 7 (6.3%) 20 or more years
5	Highest level of education (in years) mean, SD, range	Mean = 15.8, SD = $\pm$ 1.8, range = 12–20 years

Abbreviation: SD, standard deviation.

independent variable with (1) posttraumatic symptoms, (2) subjective interference, (3) number of different trauma types, (4) number of different traumatic responses, (5) depression-related difficulty, and (6) number of different subjective interferences as dependent variables; and D. Posttraumatic symptoms as the independent variable with (1) subjective interference as the dependent variable.

Results

Descriptive Statistics Results

Among 112 study participants with PTSD enrolled at the Phoenix VAHCS, demographic variables included mean (SD) age 49.5 (13.6) years, Caucasians 63/112 (56.3%), non-Caucasians 49/112 (43.8%), male 86/112 (76.8%), female 26/112 (23.2%), and mean (SD) level of education 15.8 (1.8) years (Table 10).

A high percentage 67/83 (80.7%) endorsed “combat or a war zone” as a trauma type to which they were exposed. The worse traumas were “military combat or a war zone” 41/83 (49.4%), serious accident, fire, or explosion 13/83 (15.7%), and “sexual assault by a family member or someone you know” 10/83 (12.0%). The traumas for which treatment is or was sought were “military combat or a war zone” 51/83 (61.4%), serious accident, fire, or explosion 10/83 (12.0%), and “sexual assault by a family member or someone you know” 8/83 (9.6%). The number of veterans endorsing trauma type were: “personal assault” 67/83 (80.7%), “combat, POW (or imprisonment), or torture” 71/83 (85.5%), “accidents, illnesses, or natural phenomenon” 80/83 (96.4%), and “other” 21/83 (25.3%). The mean (SD) number of different trauma types per veteran was 6.12 (2.50). The PSS includes items about that which occurred, that which was felt, or that which was thought at the time of the trauma as the traumatic response. For traumatic response, 82/83 (98.8%) veterans endorsed thoughts that life was in danger (ie, fear), feelings of helplessness, and/or feelings of terror (ie, horror) at the time of trauma. The number of veterans endorsing traumatic responses were: “personal physical injury” 49/83 (59.0%), “someone else was physically injured” 58/83 (69.9%), “thought that one’s own life was in danger” 74/83 (89.2%), “thought that someone else’s life was in danger” 68/83 (81.9%), “personal feeling of helplessness” 64/83 (77.1%), and “personal feeling of being terrified” 69/83 (83.1%). The mean (SD) number of different traumatic responses per veteran was 4.60 (1.28). The mean (SD) [range of responses] PSS was 32.41 (10.20) [9–51] (Table 11).

Table 11 PSS Frequency Distributions

I	Worse trauma	1 = 13 (15.7%) Serious accident, fire or explosion 2 = 0 (0%) Natural disaster (tornado, flood, hurricane, major earthquake) 3 = 4 (4.8%) Non-sexual assault by someone you know (physically attacked/injured) 4 = 0 (0%) Non-sexual assault by a stranger 5 = 10 (12.0%) Sexual assault by a family member or someone you know 6 = 4 (4.8%) Sexual assault by a stranger 7 = 41 (49.4%) Military combat or a war zone 8 = 1 (1.2%) Sexual contact before you were age 18 with someone who was 5 or more years older than you 9 = 2 (2.4%) Imprisonment 10 = 1 (1.2%) Torture 11 = 2 (2.4%) Life-threatening illness 12 = 5 (6.0%) Other traumatic event
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(Continued)

Table 11 (Continued).

2	Trauma for which treatment is or was sought	1 = 10 (12.0%) Serious accident, fire or explosion 2 = 0 (0%) Natural disaster (tornado, flood, hurricane, major earthquake) 3 = 3 (3.6%) Non-sexual assault by someone you know (physically attacked/injured) 4 = 0 (0%) Non-sexual assault by a stranger 5 = 8 (9.6%) Sexual assault by a family member or someone you know 6 = 6 (7.2%) Sexual assault by a stranger 7 = 51 (61.4%) Military combat or a war zone 8 = 0 (0%) Sexual contact before you were age 18 with someone who was 5 or more years older than you 9 = 1 (1.2%) Imprisonment 10 = 1 (1.2%) Torture 11 = 1 (1.2%) Life-threatening illness 12 = 2 (2.4%) Other traumatic event For 70 of 83 (84.3%) participants, the worse trauma was the reason for treatment, while for 13 of 83 (15.7%) participants, the worse trauma was not the reason for treatment.
3a	Trauma type (0–12: number of veterans for each one)	Personal assault 67/83 (80.7%) i. Non-sexual assault by someone you know (physically attacked &/or injured) 50/83 (60.2%) ii. Non-sexual assault by a stranger 54/83 (65.1%) iii. Sexual assault by a family member or someone you know 34/83 (41.0%) iv. Sexual assault by a stranger 19/83 (22.9%) v. Sexual contact before you were age 18 with someone who was 5 or more years older than you 34/83 (41.0%) Combat, POW (or imprisonment), or torture 71/83 (85.5%) i. Military combat or a war zone 67/83 (80.7%) ii. Imprisonment 26/83 (31.3%) iii. Torture 13/83 (15.7%) Accidents, illnesses, or natural phenomenon 80/83 (96.4%) i. Serious accident, fire, or explosion 75/83 (90.4%) ii. Natural disaster (tornado, flood, hurricane, or major earthquake) 56/83 (67.5%) iii. Life-threatening illness 36/83 (43.4%) Other 21/83 (25.3%) i. Other traumatic event 21/83 (25.3%)

(Continued)

Table 11 (Continued).

3b	What other trauma types were described?	Abandonment 1/83 (1.2%) burglary 1/83 (1.2%) death 14/83 (16.9%) emotional & mental abuse by family 2/83 (2.4%) legal troubles 1/83 (1.2%) relating to suicide (attempted or witnessed) 1/83 (1.2%) undescribed 1/83 (1.2%)
3c	Trauma type (N of veterans with n trauma type(s) [N = number])	Number of veterans w 0 trauma type = 0 (0%) number of veterans w 1 trauma type = 0 (0%) number of veterans w 2 trauma type = 4 (4.8%) number of veterans w 3 trauma type = 7 (8.4%) number of veterans w 4 trauma type = 11 (13.3%) number of veterans w 5 trauma type = 18 (21.7%) number of veterans w 6 trauma type = 12 (14.5%) number of veterans w 7 trauma type = 8 (9.6%) number of veterans w 8 trauma type = 9 (10.8%) number of veterans w 9 trauma type = 3 (3.6%) number of veterans w 10 trauma type = 5 (6.0%) number of veterans w 11 trauma type = 4 (4.8%) number of veterans w 12 trauma type = 2 (2.4%)
3d	Trauma type (mean, SD, & range from above)	6.12, 2.50, 2 – 12
4a	Traumatic response (0–6: number of veterans for each one)	1. personal physical injury 49/83 (59.0%) 2. someone else was physically injured 58/83 (69.9%) 3. thought that one's own life was in danger 74/83 (89.2%) 4. thought that someone else's life was in danger 68/83 (81.9%) 5. personal feeling of helplessness 64/83 (77.1%) 6. personal feeling of being terrified 69/83 (83.1%)
4b	Traumatic response (N of veterans with n traumatic response (s) [N = number])	Number of veterans w 0 traumatic responses = 1 (1.2%) number of veterans w 1 traumatic responses = 1 (1.2%) number of veterans w 2 traumatic responses = 3 (3.6%) number of veterans w 3 traumatic responses = 9 (10.8%) number of veterans w 4 traumatic responses = 20 (24.1%) number of veterans w 5 traumatic responses = 26 (31.3%) number of veterans w 6 traumatic responses = 23 (27.7%)
4c	Traumatic response (mean, SD, & range from above)	4.60, 1.28, 0 – 6

(Continued)

Table 11 (Continued).

5	Trauma symptom score (0–51) (mean, SD, & range)	32.41, 10.20, 9 – 51
6a	Trauma interference areas (0–9: number of veterans for each one)	Family relationships, friendships, or sex life interference #79/83 (95.2%) i. family relationships 66/83 (79.5%) ii. friendships 76/83 (91.6%) iii. sex life 63/83 (75.9%) Fun &/or leisure activities interference #77/83 (92.8%) i. fun & leisure activities 77/83 (92.8%) General life satisfaction or overall functioning interference #75/83 (90.4%) i. general life satisfaction 74/83 (89.2%) ii. overall functioning 68/83 (81.9%) Household duties, schoolwork, or work interference #73/83 (88%) i. household duties 60/83 (72.3%) ii. schoolwork 39/83 (47.0%) iii. work 51/83 (61.4%)
6b	Trauma interference areas (N of veterans with n trauma interference(s) [N = number])	Number of veterans w 0 interference = 1 (1.2%) number of veterans w 1 interference = 1 (1.2%) number of veterans w 2 interference = 2 (2.4%) number of veterans w 3 interference = 1 (1.2%) number of veterans w 4 interference = 5 (6.0%) number of veterans w 5 interference = 9 (10.8%) number of veterans w 6 interference = 10 (12.0%) number of veterans w 7 interference = 14 (16.9%) number of veterans w 8 interference = 17 (20.5%) number of veterans w 9 interference = 23 (27.7%)
6c	Trauma interference areas (mean, SD, & range from above)	6.92, 2.07, 0–9

The mean, standard deviation, and range of responses for Insomnia Severity Index (ISI), McGill Pain Questionnaire (MPQ) total, McGill Pain Questionnaire Dot Number (MPQ DN), McGill Pain Questionnaire Visual Analogue Scale (MPQ VAS), Patient Health Questionnaire-9 (PHQ-9), Patient Health Questionnaire-9 difficulty level (PHQ-9 difficulty level), Patient Health Questionnaire-15 (PHQ-15), Ryff Psychological Wellbeing total (PWB total), and Standard Form-36 Quality of Life total (SF-36 QOL total) are shown below (Table 12).

Inferential Statistics Results

When examining the time series of PTSD, there is a chronological sequence from demographics to trauma type, from trauma type to traumatic response, from traumatic response to posttraumatic symptoms, and from posttraumatic symptoms to subjective impairment. Along the time series, both qualitative and quantitative variables were assessed. Qualitatively, demographics affected trauma type (one association), traumatic response (five associations), and posttraumatic symptoms (one association), but did not affect subjective impairment. Trauma type affected traumatic response (six associations) and posttraumatic symptoms (four associations), but did not affect subjective impairment. Traumatic responses affected posttraumatic symptoms (six associations) and only minimally affected subjective impairment (one association). Alternatively, there were numerous associations between posttraumatic symptoms and subjective impairment (twenty associations). Quantitatively, with demographics, trauma type, and traumatic response as independent

Table 12 Other Subjective Scale Scores Frequency Distributions

	Item	Mean, SD, Range of Results	Scale Range
1	ISI	18.5, 6.8, 2–28	0-28 (higher is worse)
2	MPQ total	15.9, 11.5, 0–45	0-78 (higher is worse)
3	MPQ DN	5.4, 4.6, 0–20	
4	MPQ VAS	5.8, 2.7, 0–10	
5	PHQ-9	14.3, 6.3, 1–27	0-27 (higher is worse)
6	PHQ-9 difficulty level	Number reporting 0 = 6/112 (5.4%) 1 = 55/112 (49.1%) 2 = 33/112 (29.5%) 3 = 18/112 (16.1%)	0-3 (higher is worse)
7	PHQ-15	12.1, 5.4, 2–27	0-30 (higher is worse)
8	Ryff total	104.7, 22.9, 51–155	42-252 (higher is better)
9	SF-36 total	44.9, 19.8, 3.9–89.2	0-100 (higher is better)

variables and with PHQ-9 difficulty level, PSS total number of different trauma types, PSS total number of different traumatic responses, and PSS total number of different types of impairment as dependent variables, the only significant associations were between trauma type and PSS total number of different trauma types (three associations), trauma type and PSS total number of different traumatic responses (one association), traumatic response and PSS total number of different trauma types (two associations), and traumatic response and PSS total number of different traumatic responses (six associations).

Demographics

When demographic variables were compared with (1) trauma type, (2) number of different trauma types, (3) traumatic response, (4) number of different traumatic responses, (5) posttraumatic symptoms, (6) depression-related difficulty, (7) subjective interference, and (8) number of different subjective interferences, the following were found. (A) Trauma types were assessed as themes: (i) personal assault, (ii) combat, POW (or imprisonment), or torture, (iii) accidents, illnesses, or

Table 13 Demographic Variables versus Trauma Type

Dependent Variables	Personal Assault	Combat, POW (or Imprisonment), or Torture	Accidents, illnesses, or Natural Phenomenon	Other Trauma Type
Age	p = 0.413	p = 0.116	p = 0.835	p = 0.769
Race	p = 0.674	p = 0.970	p = 0.570 ^f	p = 0.941
Gender	males 48/63 (76.2%) females 19/20 (95.0%) p = 0.101 ^f	males 59/63 (93.7%) females 12/20 (60.0%) p = 0.001 ^f	p = 0.143 ^f	p = 0.579
Level of education	p = 0.156	p = 0.519	p = 0.886	p = 0.362

Note: f, Fisher's exact test.

Table 14 Demographic Variables versus Traumatic Response

Dependent Variables	Personal Physical Injury	Someone Else Was Physically Injured	Thought that One's Own Life Was in Danger	Thought that Someone Else's Life Was in Danger	Personal Feeling of Helplessness	Personal Feeling of Being Terrified
Age	p = 0.974	p = 0.640	p = 0.557	p = 0.769	p = 0.715	p = 0.379
Race	p = 0.879	Caucasian 38/48 (79.2%) non-Caucasian 20/35 (57.1%) p = 0.031	p = 0.483 ^f	p = 0.333	p = 0.995	p = 0.592
Gender	p = 0.143	males 50/63 (79.4%) females 8/20 (40.0%) p = 0.001	males 59/63 (93.7%) females 15/20 (75.0%) p = 0.033 ^f	males 58/63 (92.1%) females 10/20 (50.0%) p = 0.000	males 45/63 (71.4%) females 19/20 (95.0%) p = 0.033 ^f	p = 0.500 ^f
Level of education	p = 0.680	p = 0.995	p = 0.797	p = 0.965	p = 0.205	p = 0.905

Note: f, Fisher's exact test.

natural phenomenon, and (iv) other. Males were more likely than females to endorse “Combat, POW (or imprisonment), or torture” (males 59/63 [93.7%], females 12/20 [60.0%], $p = 0.001$). Otherwise, there were no associations between demographics and trauma types as classes (Table 13). (B) As traumatic response, Caucasians were more likely than non-Caucasians to endorse “Someone else was physically injured” (Caucasian 38/48 [79.2%], non-Caucasian 20/35 [57.1%], $p = 0.031$). Males were more likely than females to endorse “Someone else was physically injured” (males 50/63 [79.4%], females 8/20 [40.0%], $p = 0.001$), “Thought that one’s own life was in danger” (males 59/63 [93.7%], females 15/20 [75.0%], $p = 0.033$), and “Thought that someone else’s life was in danger” (males 58/63 [92.1%], females 10/20 [50.0%], $p = 0.000$). Females were more likely than males to endorse “Personal feeling of helplessness” (males 45/63

Table 15 Demographic Variables versus Subjective Scale Scores (Correlation Coefficient) (p-value)

	Dependent Variables	ISI	MPQ Total	MPQ DN	MPQ VAS	PHQ-9	PHQ-15	PSS Trauma Symptom Score	Ryff Total	SF-36 Total
1	Age	p = 0.863	p = 0.175	$r = -0.182$ $p = 0.055$	$r = 0.159$ $p = 0.094$	p = 0.760	p = 0.414	p = 0.814	p = 0.580	$r = -0.168$ $p = 0.076$
2	Race	p = 0.474	p = 0.940	p = 0.321	p = 0.769	p = 0.928	p = 0.874	p = 0.160	p = 0.616	p = 0.429
3	Gender	p = 0.159	p = 0.131	p = 0.643	p = 0.187	p = 0.876	p = 0.864	p = 0.303	p = 0.612	p = 0.994
4	Level of education	$r = -0.178$ $p = 0.060$	p = 0.124	$r = -0.196$ $p = 0.038$	p = 0.216	p = 0.507	$r = -0.160$ $p = 0.093$	p = 0.118	p = 0.120	p = 0.690

Table 16 Demographic Variables versus Trauma Interference Area

Dependent Variables	Family Relationships, Friendships, or Sex Life Interference	Fun &/or Leisure Activities Interference	General Life Satisfaction or Overall Functioning Interference	Household Duties, Schoolwork, or Work Interference
Age	p = 0.327	p = 0.913	p = 0.585	p = 0.853
Race	p = 0.134 ^f	p = 0.393 ^f	p = 1.00 ^f	p = 0.515 ^f

(Continued)

Table 16 (Continued).

Dependent Variables	Family Relationships, Friendships, or Sex Life Interference	Fun &/or Leisure Activities Interference	General Life Satisfaction or Overall Functioning Interference	Household Duties, Schoolwork, or Work Interference
Gender	$p = 0.244^f$	$p = 0.148^f$	male 59/63 (93.7%) female 16/20 (80.0%) $p = 0.091^f$	$p = 0.568^f$
Level of education	$p = 0.389$	$p = 0.626$	$p = 0.400$	$p = 0.618$

Note: f, Fisher's exact test.

Box 4 Associations Between Demographics and Downstream Variables

- Demographics
 - Trauma type
 1. M > F for “combat POW (or imprisonment), or torture”
 - Traumatic response
 1. C > non-C “someone else was physically injured”
 2. M > F “someone else was physically injured”
 3. M > F “thought that one’s own life was in danger”
 4. M > F “thought that someone else’s life was in danger”
 5. F > M “personal feeling of helplessness”
 - Posttraumatic symptoms
 - Level of education was inversely correlated to MPQ DN
 - Age trended to inversely correlate with MPQ DN ($p = 0.055$)
 - Level of education trended to inversely correlate with ISI ($p = 0.060$)
 - Subjective interference
 - Nil

Abbreviations: M, male; F, female; C, Caucasian; MPQ DN, McGill Pain Questionnaire Dot Number; ISI, Insomnia Severity Index.

[71.4%], females 19/20 [95.0%], $p = 0.033$). Otherwise, there were no associations between demographic variables and traumatic responses (Table 14). (C) As posttraumatic symptoms, the only statistically significant finding was that greater levels of education inversely correlated with MPQ DN ($r = -0.196$, $p = 0.038$). There were two trends – greater age trended with lower MPQ DN ($r = -0.184$, $p = 0.055$), and higher levels of education trended with lower ISI scores ($r = -0.178$, $p = 0.060$). Otherwise, there were no associations between demographic variables and posttraumatic symptoms. Hence, there were no associations between demographics and MPQ VAS, MPQ total, PHQ-9, PHQ-15, PSS, Ryff total, and SF-36 total (Table 15). (D) Subjective interferences were assessed as themes: (i) “General life satisfaction or overall functioning interference”, (ii) “Fun &/or leisure activities interference”, (iii) “Family relationships, friendships, or sex life interference”, and (iv) “Household duties, schoolwork, or work interference”. There were no associations between demographics and subjective interference themes (Table 16). See Box 4.

Trauma Type

When trauma types were compared with (1) traumatic response, (2) posttraumatic symptoms, and (3) subjective interference, the following were found. (A) Traumatic response: Of those who endorsed “personal assault”, 44/67 (65.7%) experienced “personal physical injury”, whereas of those who did not endorse “personal assault”, 5/16 (31.3%) experienced “personal physical injury” ($p = 0.012$). Of those who endorsed “Combat, POW (or imprisonment), or torture”, 55/71 (77.5%) indicated “Someone else was physically injured”, whereas of those who did not endorse “Combat, POW (or imprisonment), or torture”, 3/12 (25.0%) indicated “Someone else was physically injured” ($p =$

Table 17 Trauma Type versus Traumatic Response

Dependent Variables	Personal Physical Injury Yes = 49 No = 34	Someone Else Was Physically Injured Yes = 58 No = 25	Thought That One's Own Life Was in Danger Yes = 74 No = 9	Thought That Someone Else's Life Was in Danger Yes = 68 No = 15	Personal Feeling of Helplessness Yes = 64 No = 19	Personal Feeling of Being Terrified Yes = 69 No = 14
Personal assault ^a Yes = 67 No = 16	44/67 (65.7%) 5/16 (31.3%) p = 0.012	p = 0.130 ^f	p = 0.195 ^f	p = 0.724 ^f	p = 0.376	p = 1.00
Combat, POW (or imprisonment), or torture ^b Yes = 71 No = 12	p = 0.186	55/71 (77.5%) 3/12 (25.0%) p = 0.001 ^f	67/71 (94.4%) 7/12 (58.3%) p = 0.003	65/71 (91.5%) 3/12 (25.0%) p = 0.000 ^f	p = 0.280 ^f	p = 1.00 ^f
Accidents, illnesses, or natural phenomenon ^c Yes = 80 No = 3	p = 0.266 ^f	58/80 (72.5%) 0/3 (0%) p = 0.025 ^f	p = 0.294 ^f	68/80 (85.0%) 0/3 (0%) p = 0.005 ^f	p = 0.547 ^f	p = 1.00 ^f
Other trauma type ^d Yes = 21 No = 62	p = 0.411	p = 0.274 ^f	p = 0.437 ^f	p = 0.334 ^f	p = 0.473	p = 1.00 ^f

Notes: f, Fisher's exact test. ^aincludes i. Non-sexual assault by someone you know (physically attacked and/or injured), ii. Non-sexual assault by a stranger, iii. Sexual assault by a family member or someone you know, iv. Sexual assault by a stranger, or v. Sexual contact before you were age 18 with someone who was 5 or more years older than you. ^bincludes i. Military combat or a war zone, ii. Imprisonment, or iii. torture ^cincludes i. Serious accident, fire, or explosion, ii. Natural disaster (tornado, flood, hurricane, or major earthquake), or iii. Life-threatening illness. ^dincludes i. Other traumatic event.

0.001). Of those who endorsed "Combat, POW (or imprisonment), or torture", 67/71 (94.4%) indicated "Thought that one's own life was in danger", whereas of those who did not endorse "Combat, POW (or imprisonment), or torture", 7/12 (58.3%) indicated "Thought that one's own life was in danger" ($p = 0.003$). Of those who endorsed "Combat, POW (or imprisonment), or torture", 65/71 (91.5%) indicated "Thought that someone else's life was in danger", whereas of those who did not endorse "Combat, POW (or imprisonment), or torture", 3/12 (25.0%) indicated "Thought that someone else's life was in danger" ($p = 0.000$). Of those who endorsed "Accidents, illnesses, or natural phenomenon", 58/80 (72.5%) indicated "Someone else was physically injured", whereas of those who did not endorse "Accidents, illnesses, or natural phenomenon", 0/3 (0%) indicated "Someone else was physically injured" ($p = 0.025$). Of those who endorsed "Accidents, illnesses, or natural phenomenon", 68/80 (85.0%) indicated "Thought that someone else's life was in danger", whereas of those who did not endorse "Accidents, illnesses, or natural phenomenon", 0/3 (0%) indicated "Thought that someone else's life was in danger" ($p = 0.005$) (Table 17). (B) Posttraumatic symptoms: Those who endorsed "Combat, POW (or imprisonment), or torture" had higher mean scores on ISI than those who did not (18.5 ± 6.9 vs 14.1 ± 6.1 , $p = 0.038$) and higher mean scores on MPQ total than those who did not (15.9 ± 12.2 vs 10.1 ± 7.3 , $p = 0.033$). Those who endorsed "torture" alone had lower mean scores on MPQ VAS than those who did not (4.4 ± 3.0 vs 6.0 ± 2.6 , $p = 0.050$). Those who endorsed "Accidents, illnesses, or natural phenomenon" had lower mean scores on PHQ-15 than those who did not (11.6 ± 5.5 vs 18.3 ± 6.8 , $p = 0.044$). Otherwise, there were no associations between trauma type and posttraumatic symptoms. Hence, there were no associations between trauma type and MPQ DN, PHQ-9, PSS, Ryff total, and SF-36 total. There were no associations between personal assault and posttraumatic symptoms, and there were no associations between other trauma types and posttraumatic symptoms (Table 18). (C) Subjective interference: There were no associations between trauma types and subjective interferences (Table 19). To increase

Table 18 Trauma Types versus Subjective Scale Scores

Dependent Variables	ISI	MPQ Total	MPQ DN	MPQ VAS	PHQ-9	PHQ-15	PSS Symptom Score	Ryff Total	SF-36 Total
Personal assault ^a yes = 67 no = 16	p = 0.266	p = 0.734	p = 0.865 ["sexual assault by someone you know" yes = 34 no = 49 6.3 ± 4.6 vs 4.4 ± 4.7 p = 0.079]	p = 0.333	p = 0.937	p = 0.709	p = 0.757	103.1 ± 23.1 vs 114.3 ± 21.2 p = 0.081	p = 0.818
Combat, POW or imprisonment, or torture ^b yes = 71 no = 12	18.5 ± 6.9 vs 14.1 ± 6.1 p = 0.038	15.9 ± 12.2 vs 10.1 ± 7.3 p = 0.033	p = 0.733	p = 0.145 ["torture" yes = 13 no = 70 Yes 4.4 ± 3.0 vs No 6.0 ± 2.6 p = 0.050]	p = 0.369	p = 0.245	p = 0.128	p = 0.800	p = 0.248
Accidents, illnesses, or natural phenomenon ^c yes = 80 no = 3	p = 0.955	p = 0.753	p = 0.752	p = 0.955	p = 0.399	11.6 ± 5.5 vs 18.3 ± 6.8 p = 0.044	p = 0.742	p = 0.699	p = 0.449
Other trauma type ^d yes = 21 no = 62	p = 0.934	p = 0.953	p = 0.469	p = 0.423	p = 0.451	p = 0.999	p = 0.549	97.5 ± 23.2 vs 107.9 ± 22.5 p = 0.073	p = 0.569

Notes: ^aincludes i. Non-sexual assault by someone you know (physically attacked and/or injured), ii. Non-sexual assault by a stranger, iii. Sexual assault by a family member or someone you know, iv. Sexual assault by a stranger, or v. Sexual contact before you were age 18 with someone who was 5 or more years older than you. ^bincludes i. Military combat or a war zone, ii. Imprisonment, or iii. torture. ^cincludes i. Serious accident, fire, or explosion ii. Natural disaster (tornado, flood, hurricane, or major earthquake), or iii. Life-threatening illness. ^dincludes i. Other traumatic event. Wherever comparisons are made, means for the "yes" response group are listed first and means for the "no" response group are listed last.

Table 19 Trauma Type versus Trauma Interference Area

Dependent Variables	Family Relationships, Friendships, or Sex Life Interference	Fun and/or Leisure Activities Interference	General Life Satisfaction or Overall Functioning Interference	Household Duties, Schoolwork, or Work Interference
Personal assault ^a	$p = 1.0^f$	$p = 0.591^f$	$p = 0.647^f$	$p = 1.0^f$
Combat, POW (or imprisonment), or torture ^b	$p = 1.0^f$	$p = 1.0^f$	$p = 1.0^f$	$p = 1.0^f$
Accidents, illnesses, or natural phenomenon ^c	$p = 1.0^f$	$p = 1.0^f$	$p = 1.0^f$	$p = 1.0^f$
Other trauma type ^d	$p = 0.264^f$	$p = 0.640^f$	$p = 1.00^f$	$p = 1.00^f$

Notes: ^f, Fisher's exact test. ^aincludes i. Non-sexual assault by someone you know (physically attacked and/or injured), ii. Non-sexual assault by a stranger, iii. Sexual assault by a family member or someone you know, iv. Sexual assault by a stranger, or v. Sexual contact before you were age 18 with someone who was 5 or more years older than you. ^bincludes i. Military combat or a war zone, ii. Imprisonment, or iii. torture. ^cincludes i. Serious accident, fire, or explosion ii. Natural disaster (tornado, flood, hurricane, or major earthquake), or iii. Life-threatening illness. ^dincludes i. Other traumatic event.

Table 20 Trauma Type versus Trauma Interference Area (Specific)

Dependent Variables	Family	Friendships	Sex	Fun and Leisure Activities	General Life	Overall	Household Duties	Schoolwork	Work
Personal assault	$p = 0.504^f$	$p = 0.336^f$	$p = 1.00^f$	$p = 0.591^f$	$p = 1.00^f$	$p = 1.00^f$	$p = 1.00^f$	$p = 0.773$	$p = 0.504$
Combat, POW (or imprisonment), or torture	$p = 0.704^f$	$p = 0.586^f$	$p = 0.471^f$	$p = 1.00^f$	$p = 1.00^f$	$p = 1.00^f$	$p = 0.730^f$	$p = 0.125^f$	$p = 0.128^f$
Accidents, illnesses, or natural phenomenon	$p = 1.00^f$	$p = 1.00^f$	$p = 0.568^f$	$p = 1.00^f$	$p = 1.00^f$	$p = 1.00^f$	$p = 1.00^f$	$p = 0.598^f$	$p = 0.556^f$
Other trauma type	$p = 0.288$	$p = 0.362^f$	$p = 0.769^f$	$p = 0.640^f$	$p = 0.686^f$	$p = 1.00^f$	$p = 0.403^f$	$p = 0.947$	$p = 0.132$

Note: ^f, Fisher's exact test.

fidelity, we assessed trauma types versus individual subjective interferences and again found no associations between trauma types and individual subjective interferences (Table 20). See Box 5.

Traumatic Response

When traumatic response was compared with (1) posttraumatic symptoms and (2) subjective interference the following were found. (A) Posttraumatic symptoms: Those who endorsed “personal physical injury”, versus those who did not, had higher mean ISI scores (19.3 ± 5.9 vs 15.8 ± 7.8 , $p = 0.030$) and higher mean PSS scores (34.8 ± 8.5 vs 29.0 ± 11.6 , $p = 0.017$). Those who endorsed “Thought that one’s own life was in danger”, versus those who did not, had higher mean ISI scores (18.6 ± 6.5 vs 12.3 ± 8.0 , $p = 0.010$), higher mean MPQ total (16.2 ± 11.8 vs 5.2 ± 4.3 , $p = 0.000$), and higher mean PSS scores (33.2 ± 10.0 vs 25.6 ± 9.5 , $p = 0.032$). Those who endorsed “Thought that someone else’s life was in danger”, versus those who did not, had higher mean ISI scores (18.9 ± 6.7 vs 13.3 ± 6.4 , $p = 0.004$). Otherwise, there were no associations between traumatic response and posttraumatic symptoms. Hence, there were no associations between traumatic response and MPQ DN, MPQ VAS, PHQ-9, PHQ-15, Ryff total, and SF-36 total. There were no associations between “someone else was physically injured” and posttraumatic symptoms, between “personal feeling of helplessness” and posttraumatic symptoms, and between “personal feeling of being terrified” and posttraumatic symptoms (Table 21). (B) Subjective interference: “Personal physical injury” was associated with “fun &/or leisure activities interference”; 48/49 (98.0%) with personal physical injury endorsed the impairment, whereas 29/34 (85.3%) without personal physical injury endorsed the impairment ($p = 0.040$). “Personal physical injury” trended with “general life satisfaction or overall functioning interference”; 47/49 (95.9%) with personal physical injury endorsed the impairment,

Box 5 Associations Between Trauma Type and Downstream Variables

- Trauma type
 - Traumatic response
 - “Personal assault” associated with
 - “personal physical injury”
 - “Combat, POW (or imprisonment), or torture” associated with
 - “someone else was physically injured”
 - “thought that one’s own life was in danger”
 - “thought that someone else’s life was in danger”
 - “Accidents, illnesses, or natural phenomenon” associated with
 - “someone else was physically injured”
 - “thought that someone else’s life was in danger”
 - Posttraumatic symptoms
 - “Combat, POW (or imprisonment), or torture” had higher
 - ISI
 - MPQ total
 - Torture alone had lower
 - MPQ VAS
 - “Accidents, illnesses, or natural phenomenon” had lower
 - PHQ-15
 - Subjective interference
 - Nil

Abbreviations: POW, prisoner of war; ISI, Insomnia Severity Index; MPQ VAS, McGill Pain Questionnaire Visual Analog Scale, PHQ-15, Patient Health Questionnaire-15.

whereas 28/34 (82.4%) without personal physical injury endorsed the impairment ($p = 0.059$). Otherwise, there were no associations between traumatic response and subjective interference (Table 22). See Box 6.

Posttraumatic Symptoms

When posttraumatic symptoms were compared with subjective interference, the following were found. There were no associations between MPQ DN and subjective impairment. MPQ total was associated with “Fun &/or leisure activities interference” (15.7 ± 11.9 [Yes] vs 6.7 ± 5.2 [No]) ($p = 0.005$). MPQ VAS approached statistical significance with “Fun &/or leisure activities interference” (5.9 ± 2.7 [Yes] vs 3.9 ± 2.5 [No]) ($p = 0.075$). MPQ VAS was associated with “General life satisfaction or Overall functioning interference” (6.0 ± 2.5 [Yes] vs 3.3 ± 3.3 [No]) ($p = 0.006$). PHQ-15 approached statistical significance with “Fun &/or leisure activities interference” (12.1 ± 5.7 [Yes] vs 8.2 ± 3.9 [No]) ($p = 0.099$). PHQ-15 was associated with “General life satisfaction or Overall functioning interference” (12.4 ± 5.6 [Yes] vs 6.9 ± 3.1 [No]) ($p = 0.008$). ISI was associated with “Fun &/or leisure activities interference” (18.4 ± 6.8 [Yes] vs 11.3 ± 5.2 [No]) ($p = 0.015$) and “General life satisfaction or Overall functioning interference” (18.5 ± 6.7 [Yes] vs 12.3 ± 6.5 [No]) ($p = 0.014$). SF-36 total was associated with “Fun &/or leisure activities interference” (44.5 ± 19.2 [Yes] vs 60.6 ± 12.0 [No]) ($p = 0.047$), “General life satisfaction or overall functioning interference” (43.3 ± 18.0 [Yes] vs 67.9 ± 15.4 [No]) ($p = 0.000$), and “Family relationships, friendships, or sex life interference” (44.6 ± 18.9 [Yes] vs 68.0 ± 7.0 [No]) ($p = 0.016$). PHQ-9 was associated with all subjective impairment categories – “Fun &/or leisure activities interference” (15.3 ± 6.0 [Yes] vs 5.7 ± 4.0 [No]) ($p = 0.000$), “General life satisfaction or overall functioning interference” (15.6 ± 5.8 [Yes] vs 5.4 ± 2.9 [No]) ($p = 0.000$), “Family relationships, friendships, or sex life interference” (15.1 ± 6.1 [Yes] vs 5.3 ± 3.3 [No]) ($p = 0.002$), and “Household duties, schoolwork, or work interference” (15.0 ± 6.2 [Yes] vs 5.7 ± 3.1 [No]) ($p = 0.012$). PSS was associated with all subjective impairment categories – “Fun &/or leisure activities interference” (33.6 ± 9.5 [Yes] vs 17.7 ± 6.8 [No]) ($p = 0.000$), “General life satisfaction or overall functioning interference” (34.0 ± 9.3 [Yes] vs 17.6 ± 5.7 [No]) ($p = 0.000$), “Family relationships, friendships, or sex life interference” (33.3 ± 9.6 [Yes] vs 15.5 ± 6.4 [No]) ($p = 0.000$), and “Household duties, schoolwork, or work interference” (33.0 ± 9.9 [Yes] vs 17.0 ± 6.2 [No]) ($p = 0.007$). Ryff total was associated with all subjective impairment categories – “Fun &/or leisure activities interference”

Table 21 Traumatic Response versus Subjective Scale Scores

Dependent Variables	ISI	MPQ Total	MPQ DN	MPQ VAS	PHQ-9	PHQ-15	PSS	Ryff Total	SF-36 Total
Personal physical injury yes = 49 no = 34	19.3 ± 5.9 vs 15.8 ± 7.8 p = 0.030	17.0 ± 12.3 vs 12.2 ± 10.4 p = 0.067	p = 0.167	p = 0.522	p = 0.150	p = 0.169	34.8 ± 8.5 vs 29.0 ± 11.6 p = 0.017	p = 0.382	p = 0.498
Someone else was physically injured yes = 58 no = 25	18.8 ± 6.7 vs 15.8 ± 7.0 p = 0.070	p = 0.598	p = 0.782	p = 0.497	p = 0.559	p = 0.719	p = 0.830	p = 0.489	p = 0.730
Thought that one's own life was in danger yes = 74 no = 9	18.6 ± 6.5 vs 12.3 ± 8.0 p = 0.010	16.2 ± 11.8 vs 5.2 ± 4.3 p = 0.000	p = 0.520	p = 0.149	p = 0.113	p = 0.917	33.2 ± 10.0 vs 25.6 ± 9.5 p = 0.032	p = 0.889	p = 0.726
Thought that someone else's life was in danger yes = 68 no = 15	18.9 ± 6.7 vs 13.3 ± 6.4 p = 0.004	p = 0.637	p = 0.843	p = 0.152	p = 0.714	p = 0.967	33.3 ± 10.0 vs 28.2 ± 10.3 p = 0.077	p = 0.955	p = 0.880
Personal feeling of helplessness yes = 64 no = 19	p = 0.522	p = 0.435	p = 0.937	p = 0.508	p = 0.445	p = 0.690	p = 0.529	p = 0.434	p = 0.745
Personal feeling of being terrified yes = 69 no = 14	p = 0.599	p = 0.224	p = 0.276	p = 0.892	p = 0.344	p = 0.644	p = 0.429	107.2 ± 22.4 vs 95.8 ± 24.7 p = 0.092	p = 0.920

Note: blue row = dependent variables.

Table 22 Traumatic Response versus Trauma Interference Area

Dependent Variables	Household Duties, Schoolwork, or Work Interference	Family Relationships, Friendships, or Sex Life Interference	General Life Satisfaction or Overall Functioning Interference	Fun and/or Leisure Activities Interference
Personal physical injury	$p = 0.565^f$	$p = 1.0^f$	47/49 (95.9%) with personal physical injury endorsed the impairment 28/34 (82.4%) without personal physical injury endorsed the impairment $p = 0.059^f$	48/49 (98.0%) with personal physical injury endorsed the impairment 29/34 (85.3%) without personal physical injury endorsed the impairment $p = 0.040^f$
Someone else was physically injured,	$p = 0.550^f$	$p = 0.310^f$	$p = 1.0^f$	$p = 0.663^f$
Thought that one's own life was in danger	$p = 0.294^f$	$p = 1.0^f$	$p = 1.0^f$	$p = 0.125^f$
Thought that someone else's life was in danger	$p = 1.0^f$	$p = 1.0^f$	$p = 0.631^f$	$p = 1.0^f$
Personal feeling of helplessness	$p = 0.130^f$	$p = 0.223^f$	$p = 1.0^f$	$p = 0.616^f$
Personal feeling of being terrified	$p = 0.430^f$	$p = 0.530^f$	$p = 1.0^f$	$p = 1.0^f$

Notes: f, Fisher's exact test. blue row = dependent variables.

(103.1 ± 22.5 [Yes] vs 132.3 ± 5.6 [No]) ($p = 0.002$), “General life satisfaction or overall functioning interference” (102.5 ± 22.2 [Yes] vs 130.9 ± 12.0 [No]) ($p = 0.001$), “Family relationships, friendships, or sex life interference” (103.5 ± 22.1 [Yes] vs 139.8 ± 11.5 [No]) ($p = 0.002$), and “Household duties, schoolwork, or work interference” (103.8 ± 22.1 [Yes] vs 144.0 ± 10.1 [No]) ($p = 0.002$) (Table 23). See Box 7. PSS correlated with ISI ($r = 0.639$, $p = 0.000$), MPQ total ($r =$

Box 6 Associations Between Traumatic Response and Downstream Variables

- Traumatic response
 - Posttraumatic symptoms
 - “Personal physical injury” had higher
 - ISI
 - PSS
 - “Thought that one’s own life was in danger” had higher
 - ISI
 - PSS
 - MPQ total
 - “Thought that someone else’s life was in danger” had higher
 - ISI
 - Subjective interference
 - “Personal physical injury” was associated with
 - “fun &/or leisure activities interference”
 - “Personal physical injury” trended with
 - “general life satisfaction or overall functioning interference” ($p = 0.059$)

Abbreviations: ISI, Insomnia Severity Index; PSS, Posttraumatic Stress Disorder Symptom Scale; MPQ, McGill Pain Questionnaire.

Table 23 Subjective Scale Variables versus Traumatic Residual Interference

Dependent Variables	Household Duties, Schoolwork, or Work Interference Yes = 80 No = 3	Family Relationships, Friendships, or Sex Life Interference Yes = 79 No = 4	General Life Satisfaction Or Overall Functioning Interference Yes = 75 No = 8	Fun &/or Leisure Activities Interference Yes = 77 No = 6
MPQ DN	p = 0.152	p = 0.220	p = 0.124	p = 0.649
MPQ total	p = 0.724	p = 0.382	p = 0.161	15.7 ± 11.9 ^a vs 6.7 ± 5.2 ^b p = 0.005
MPQ VAS	p = 0.253	p = 0.384	6.0 ± 2.5 ^a vs 3.3 ± 3.3 ^b p = 0.006	5.9 ± 2.7 ^a vs 3.9 ± 2.5 ^b p = 0.075
PHQ-15	p = 0.195	p = 0.566	12.4 ± 5.6 ^a vs 6.9 ± 3.1 ^b p = 0.008	12.1 ± 5.7 ^a vs 8.2 ± 3.9 ^b p = 0.099
ISI	18.2 ± 6.9 ^a vs 10.7 ± 3.8 ^b p = 0.065	18.2 ± 6.9 ^a vs 12.3 ± 4.4 ^b p = 0.094	18.5 ± 6.7 ^a vs 12.3 ± 6.5 ^b p = 0.014	18.4 ± 6.8 ^a vs 11.3 ± 5.2 ^b p = 0.015
SF-36 total	p = 0.322	44.6 ± 18.9 ^a vs 68.0 ± 7.0 ^b p = 0.016	43.3 ± 18.0 ^a vs 67.9 ± 15.4 ^b p = 0.000	44.5 ± 19.2 ^a vs 60.6 ± 12.0 ^b p = 0.047
PHQ-9	15.0 ± 6.2 ^a vs 5.7 ± 3.1 ^b p = 0.012	15.1 ± 6.1 ^a vs 5.3 ± 3.3 ^b p = 0.002	15.6 ± 5.8 ^a vs 5.4 ± 2.9 ^b p = 0.000	15.3 ± 6.0 ^a vs 5.7 ± 4.0 ^b p = 0.000
PSS	33.0 ± 9.9 ^a vs 17.0 ± 6.2 ^b p = 0.007	33.3 ± 9.6 ^a vs 15.5 ± 6.4 ^b p = 0.000	34.0 ± 9.3 ^a vs 17.6 ± 5.7 ^b p = 0.000	33.6 ± 9.5 ^a vs 17.7 ± 6.8 ^b p = 0.000
Ryff total	103.8 ± 22.1 ^a vs 144.0 ± 10.1 ^b p = 0.002	103.5 ± 22.1 ^a vs 139.8 ± 11.5 ^b p = 0.002	102.5 ± 22.2 ^a vs 130.9 ± 12.0 ^b p = 0.001	103.1 ± 22.5 ^a vs 132.3 ± 5.6 ^b p = 0.002

Notes: ^aindependent variable mean in those endorsing yes to the dependent variable. ^bindependent variable mean in those endorsing no to the dependent variable. blue row = dependent variables. progressively lighter-to-darker rows = progressively greater types of interference.

0.452, p = 0.000), PHQ-9 (r = 0.750, p = 0.000), PHQ-15 (r = 0.483, p = 0.000), Ryff wellbeing (r = - 0.571, p = 0.000), and SF-36 quality of life scales (r = - 0.551, p = 0.000).

Quantitative Assessments are Shown as Follows

Demographics Versus Quantitative Variables

- There were no associations between demographic variables and PHQ-9 (depression) difficulty level.

Box 7 Associations Between Posttraumatic Symptoms and Subjective Interference

MPQ DN

- No association with subjective impairment

MPQ total associated with

- Fun &/or leisure activities interference

MPQ VAS associated with

- General life satisfaction or overall functioning interference

PHQ-15 associated with

- General life satisfaction or overall functioning interference

ISI associated with

- General life satisfaction or overall functioning interference
- Fun &/or leisure activities interference

SF-36 associated with

- General life satisfaction or overall functioning interference
- Fun &/or leisure activities interference
- Family relationships, friendships, or sex life interference

PHQ-9 associated with

- General life satisfaction or overall functioning interference
- Fun &/or leisure activities interference
- Family relationships, friendships, or sex life interference
- Household duties, schoolwork, or work interference

PSS associated with

- General life satisfaction or overall functioning interference
- Fun &/or leisure activities interference
- Family relationships, friendships, or sex life interference
- Household duties, schoolwork, or work interference

Ryff total associated with

- General life satisfaction or overall functioning interference
- Fun &/or leisure activities interference
- Family relationships, friendships, or sex life interference
- Household duties, schoolwork, or work interference

Abbreviations: MPQ DN, McGill dot number; MPQ total, McGill total; MPQ VAS, McGill visual analogue scale; PHQ-15, Patient Health Questionnaire-15; ISI, Insomnia Sleep Index; SF-36, 36-Item Short Form Survey; PHQ-9, Patient Health Questionnaire-15; PSS, PTSD Symptom Scale; Ryff, Ryff Psychological Wellbeing.

- There were no associations between demographic variables and number of different trauma types represented quantitatively.
- There were no associations between demographic variables and number of different traumatic responses represented quantitatively.
- There were no associations between demographic variables and number of different subjective interferences represented quantitatively.

Trauma Type versus Quantitative Variables

- Those who endorsed “personal assault” had more trauma types quantitatively than those who did not (7.28 vs 3.94) ($p < 0.001$).
- Those who endorsed “Combat, POW (or imprisonment), or torture” had more trauma types quantitatively than those who did not (6.82 vs 5.58) ($p = 0.030$).
- Those who endorsed “other” had more trauma types quantitatively than those who did not (8.43 vs 6.03) ($p < 0.001$).

Table 24 Associations Between Demographics, Trauma Type, and Traumatic Response as Independent Variables with PHQ-9 Difficulty Level (Numerically), PSS Trauma Type (Total Number), PSS Traumatic Response (Total Number), and PSS Trauma Interference Area (Total Number) as Dependent Variables

Dependent Variables	PHQ-9 Difficulty Level	PSS Trauma Type (Total Number)	PSS Traumatic Response (Total Number)	PSS Trauma Interference Area (Total Number)
Age	$p = 0.687$	$p = 0.923$	$p = 0.138$	$p = 0.904$
Race	$p = 0.703$	$p = 0.669$	$p = 0.555$	$p = 0.128$
Gender	$p = 0.988$	$p = 0.565$	$p = 0.759$	$p = 0.815$
Level of education	$p = 0.775$	$r = 0.186$ $p = 0.092$	$p = 0.197$	$p = 0.152$
Personal assault ^a yes = 67 no = 16	$p > 0.05$	yes = 7.28 no = 3.94 $p < 0.001$	$p > 0.05$	$p > 0.05$
Combat, POW or imprisonment, or torture ^b yes = 71 no = 12	$p > 0.05$	yes = 6.82 no = 5.58 $p = 0.030$	yes = 4.83 no = 3.25 $p < 0.001$	$p > 0.05$
Accidents, illnesses, or natural phenomenon ^c yes = 80 no = 3	$p > 0.05$	$p > 0.05$	$p > 0.05$	$p > 0.05$
Other trauma type ^d yes = 21 no = 62	$p > 0.05$	yes = 8.43 no = 6.03 $p < 0.001$	$p > 0.05$	$p > 0.05$
Personal physical injury yes = 49 no = 34	$p > 0.05$	yes = 7.16 no = 5.88 $p = 0.037$	yes = 5.08 no = 3.91 $p < 0.001$	yes = 7.31 no = 6.35 $p = 0.057$
Someone else was physically injured yes = 58 no = 25	$p > 0.05$	$p > 0.05$	yes = 5.10 no = 3.44 $p < 0.001$	$p > 0.05$
Thought that one's own life was in danger yes = 74 no = 9	$p > 0.05$	$p > 0.05$	yes = 4.88 no = 2.33 $p < 0.001$	$p > 0.05$
Thought that someone else's life was in danger yes = 68 no = 15	$p > 0.05$	yes = 6.90 no = 5.47 $p = 0.001$	yes = 4.97 no = 2.93 $p < 0.001$	$p > 0.05$
Personal feeling of helplessness yes = 64 no = 19	$p > 0.05$	$p > 0.05$	yes = 4.88 no = 3.68 $p < 0.001$	$p > 0.05$

(Continued)

Table 24 (Continued).

Dependent Variables	PHQ-9 Difficulty Level	PSS Trauma Type (Total Number)	PSS Traumatic Response (Total Number)	PSS Trauma Interference Area (Total Number)
Personal feeling of being terrified yes = 69 no = 14	$p > 0.05$	$p > 0.05$	yes = 4.87 no = 3.29 $p < 0.001$	$p > 0.05$

Notes: ^aincludes i. Non-sexual assault by someone you know (physically attacked and/or injured), ii. Non-sexual assault by a stranger; iii. Sexual assault by a family member or someone you know, iv. Sexual assault by a stranger; or v. Sexual contact before you were age 18 with someone who was 5 or more years older than you. ^bincludes i. Military combat or a war zone, ii. Imprisonment, or iii. torture. ^cincludes i. Serious accident, fire, or explosion, ii. Natural disaster (tornado, flood, hurricane, or major earthquake), or iii. Life-threatening illness. ^dincludes i. Other traumatic event. white rows = demographics. light gray rows = trauma types. dark gray rows = traumatic responses.

- There was no association between “accidents, illnesses, or natural phenomenon” and number of different trauma types.
- Those who endorsed “Combat, POW (or imprisonment), or torture” had more traumatic responses quantitatively than those who did not (4.83 vs 3.25) ($p < 0.001$).
- There were no other associations between qualitative trauma type and number of different traumatic responses.
- There were no associations between qualitative trauma type and PHQ-9 difficulty level or between qualitative trauma type and number of different interference areas.

Traumatic Response versus Quantitative Variables

- Those who endorsed “Personal physical injury” had more trauma types quantitatively compared with those who did not (7.16 vs 5.88) ($p = 0.037$).
- Those who endorsed “Thought that someone else’s life was in danger” had more trauma types quantitatively than those who did not (6.90 vs 5.47) ($p < 0.001$).
- There were no other associations between qualitative traumatic response and number of different trauma types.
- Those who endorsed “Personal physical injury” had more traumatic responses quantitatively compared with those who did not (5.08 vs 3.91) ($p < 0.001$).
- Those who endorsed “Someone else was physically injured” had more traumatic responses quantitatively than those who did not (5.10 vs 3.44) ($p < 0.001$).
- Those who endorsed “Thought that one’s own life was in danger” had more traumatic responses quantitatively than those who did not (4.88 vs 2.33) ($p < 0.001$).
- Those who endorsed “Thought that someone else’s life was in danger” had more traumatic responses quantitatively than those who did not (4.97 vs 2.93) ($p < 0.001$).
- Those who endorsed “Personal feeling of helplessness” had more traumatic responses quantitatively than those who did not (4.88 vs 3.68) ($p < 0.001$).
- Those who endorsed “Personal feeling of being terrified” had more traumatic responses quantitatively than those who did not (4.87 vs 3.29) ($p < 0.001$).
- “Personal physical injury” trended with trauma interference areas quantitatively (7.31 vs 6.35) ($p = 0.057$).
- There were no associations between qualitative traumatic responses and PHQ-9 difficulty level or between traumatic responses and number of different interference areas (barring the trend mentioned above).

Table 24 shows demographics, trauma types, and traumatic responses as independent variables and PHQ-9 difficulty level, PSS number of different trauma types, PSS number of different traumatic responses, and PSS number of different types of impairment as dependent variables.

Discussion

Several unique results pertaining to demographics, trauma type, traumatic response, posttraumatic symptoms, and subjective interference were found. Many of the veterans enrolled in this study participated in the Gulf War (Operation Desert Shield and Operation Desert Storm), OIF, OEF, and/or Operation New Dawn (OND): 43.8% were non-Caucasians, compared to 36.2% of the US general population,¹¹³ and 23.2% were females, compared to 11% of the US veteran population.¹⁴⁵ Hence, non-Caucasians and females are well represented in this study. Veterans participating in this study had a relatively high number of years of education, averaging almost 16 years, which is the equivalent of a college education. This raises the possibility that those with PTSD with higher education might be more likely to participate in a clinical trial than those with PTSD with lower education. In some scenarios, past trauma begets future trauma; that is, those who have had past traumas may be at risk for future traumas.^{127,146} The results from this study are similar; that is, each veteran had experienced on average approximately six different trauma types, which is a considerably high trauma burden. PTSD includes a trauma type that is linked to a traumatic response that is linked to posttraumatic symptoms (including duration, frequency, intensity, and pervasiveness) that is linked to impairment (functional interference) (Figure 1). We asked the following questions. Do demographics affect trauma type and other downstream variables? If so, how? Does trauma type affect traumatic response and other downstream variables? If so, how? Does traumatic response affect posttraumatic symptoms and other downstream variables? If so, how? And do posttraumatic symptoms affect interference areas? If so, how?

Demographic Factors

The finding that Caucasians were more likely than non-Caucasians to endorse “Someone else was physically injured” is consistent with Caucasians participating more than non-Caucasians in combat¹⁴⁷ and Caucasians employed more than non-Caucasians as first responders.¹⁴⁸ The notions of Caucasians participating more than non-Caucasians in combat and Caucasians employed more than non-Caucasians as first responders likely are factors related to the racial makeup of the US, with Caucasians representing a greater percentage of society than non-Caucasians.¹¹² The finding that males were more likely than females to endorse “Combat, POW (or imprisonment), or torture” as trauma type is consistent with males participating more than females in combat.¹⁴⁹ Similarly, the findings that males were more likely than females to endorse “Someone else was physically injured”, “Thought that one’s own life was in danger”, and “Thought that someone else’s life was in danger” as traumatic responses are consistent with males participating more than females in combat.¹⁴⁹ The finding that females were more likely than males to endorse “Personal feeling of helplessness” as a traumatic response is consistent with females being more vulnerable than males to sexual assault in the US.¹⁵⁰ A higher level of education predicted a fewer number of somatoform painful locations. This is consistent with literature findings that lower levels of education are associated with higher degrees of somatization.^{151–153} Also, a higher level of education trended with fewer sleep complaints. There may be a potential relationship between education level and defense mechanisms, with higher education enabling more mature defense mechanisms and lower education relying on more immature defense mechanisms. Hence, higher education might be associated with more developed coping strategies and less reliance on primitive defense mechanisms to manage stress. The finding that greater age trended with fewer somatic pain locations was a paradoxical finding.¹⁵⁴ An unexpected finding was that demographic variables did not predict subjective impairment.

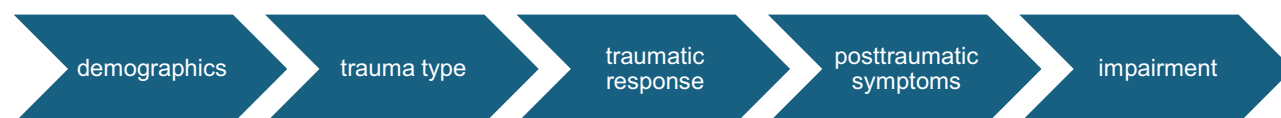


Figure 1 A time series for PTSD.

Trauma Type

The finding that “Personal assault” as a trauma type was associated with “personal physical injury” as a traumatic response was an expected finding, as might generally occur with assault victims. The finding that “Combat, POW (or imprisonment), or torture” was associated with “someone else was physically injured”, “thought that one’s own life was in danger”, and “thought that someone else’s life was in danger” is consistent with, for example, battlefield exposure. The finding that “Accidents, illnesses, or natural phenomenon” was associated with “someone else was physically injured” and “thought that someone else’s life was in danger” is consistent with, for example, first responders. The experience, or witnessing in another, of “Combat, POW (or imprisonment), or torture” was associated with greater insomnia and increased total pain. These are expected findings that agree with the literature, since manifestations following traumatic stress include disturbed sleep and somatization.^{155,156} Veterans with Gulf War exposure and/or PTSD are prone to insomnia and pain.^{157,158} The experience, or witnessing in another, of “torture” alone was associated with lower pain intensity. This is an unexpected finding that contradicts the literature.^{159–162} The experience, or witnessing in another, of “Accidents, illnesses, or natural phenomenon” was protective against somatization. Studies have shown that traumas involving assault are associated with greater PTSD symptoms than traumas involving accidents.^{102,163} Hence, traumas that are intentional (eg, assaults) may translate to more somatization than traumas that are unintentional (eg, accidents). Also, desensitization of somatoform symptoms may occur, for example, among first responders. DSM-IV-TR PTSD criteria required intensely feeling fear, helplessness, or horror. Alternatively, PSS broadly assesses that which was experienced (self was injured or another was injured), that which was thought (thought that one’s life was in danger or thought that another’s life was in danger), and that which was felt (felt helpless or felt terrified). Since it is assumed that if one thought that one’s life was in danger or thought that another’s life was in danger, then there may likely be fear associated with such thoughts, then the endorsement of these measures may likely involve feelings of fear. Although there were associations between trauma type and traumatic responses of injury (ie, self was injured or another was injured) and between trauma type and traumatic responses including thoughts of danger (ie, thought that own life was in danger or thought that someone else’s life was in danger), there were no associations between trauma type and designated feelings that were experienced at the time of the trauma (ie, feeling helpless or feeling terrified). An unexpected finding was that trauma types did not predict subjective impairment.

Traumatic Response

Apprehension, dread, fear, horror, and terror share commonalities and subtle differences, such as horror being a reaction and terror being a feeling.¹⁶⁴ Perceived life threat is associated with feeling terrified.¹⁶⁵ Hence, DSM-IV-TR “fear” traumatic response corresponds to PSS items addressing “Thought that one’s own life was in danger” and “Thought that someone else’s life was in danger” (assuming congruence between thoughts and feelings), “helplessness” corresponds to PSS item addressing “personal feeling of helplessness”, and “horror” corresponds to PSS item addressing “personal feeling of being terrified” (assuming congruence between reaction and feelings). Allowing these assumptions, fear of injury to self predicted greater posttraumatic symptoms than actual injury to self: “thought that one’s own life was in danger” predicted insomnia, PTSD symptoms, and total pain, whereas “self was physically injured” predicted only insomnia and PTSD symptoms. Hence, fear of bodily injury was associated with later bodily pain, but actual bodily injury was not. An unexpected finding was that an injury to oneself was not associated with any of the pain measures, somatization, depression, wellbeing, or quality of life. And fear of injury to another predicted greater posttraumatic symptoms than actual injury to another: “thought that someone else’s life was in danger” predicted insomnia, whereas “someone else was physically injured” did not predict any posttraumatic symptoms. Similar to trauma type not being linked to the designated feelings of “personal feeling of helplessness” and “personal feeling of being terrified”, these designated feelings did not predict any of the posttraumatic symptoms measured. Traumatic response was removed during the DSM-IV-TR to DSM-5 transition, because in approximately one-fourth of those exposed to traumatic stress, the immediate emotional experience is other than fear, horror, or helplessness (eg, anger, confusion, or numbness).^{10–13} We found that in almost all cases (98.8%) a traumatic response occurs, but in most cases the traumatic response is broader, than those that were designated in DSM-IV-TR, including thought that one’s own life was in danger, thought that another’s life was in danger, feeling helpless, or feeling terrified. Other than “personal physical injury” associated with “fun &/or leisure activities interference” and trending with “general life satisfaction or overall functioning interference”, traumatic response did not predict subjective impairment.

Posttraumatic Symptoms

Social support during the posttraumatic phase has been shown to mitigate posttraumatic symptoms.¹²⁷ Alternatively, in cases of concomitant concussion and PTSD, the suggestion or endorsement of a postconcussive syndrome may iatrogenically elicit an expectation of such symptoms.¹⁶⁶ The greater the burden of posttraumatic symptoms, the greater the degree of subjective impairment. Number of somatoform painful locations (MPQ DN) did not affect subjective interference. Total pain (MPQ total) affected only “Fun &/or leisure activities”.

Pain intensity (MPQ VAS) and somatization (PHQ-15) affected “General life satisfaction or overall functioning” and approached statistical significance with “Fun &/or leisure activities”. Insomnia (ISI) affected “Fun &/or leisure activities” and “General life satisfaction or overall functioning”. Quality of life (SF-36) affected “Fun &/or leisure activities”, “General life satisfaction or overall functioning”, and “Family relationships, friendships, or sex life”. PTSD symptoms (PSS), depressive symptoms (PHQ-9), and psychological well-being (Ryff total) affected all areas of subjective impairment. Capability appears to be lost in a hierarchical order. As symptom burden increases, “Fun &/or leisure activities” are lost first, “General life satisfaction or overall functioning” second, “Family relationships, friendships, or sex life” third, and “Household duties, schoolwork, or work” fourth. In the time series of PTSD, independent variables were examined for their downstream effects on dependent variables: i. demographics – trauma type, traumatic response, posttraumatic symptoms, and subjective interference; ii. trauma type – traumatic response, posttraumatic symptoms, and subjective interference; iii. traumatic response – posttraumatic symptoms and subjective interference; and iv. posttraumatic symptoms – subjective interference (Figure 2). “Personal physical injury” mildly affected subjective interference. Otherwise, demographics, trauma type, and traumatic response did not affect subjective interference (Table 25). More emotionally laden scales (eg, PHQ-9, PSS, Ryff total, and SF-36 total) were associated with relatively greater subjective interference, whereas more physically laden scales (eg, MPQ DN, MPQ total, MPQ VAS, ISI, and PHQ-15) were associated with relatively lesser subjective interference. The correlation of

Demographics	Trauma type	Traumatic response	Posttraumatic symptoms
a. Males were more likely than females to report the type of trauma as 'combat, POW (or imprisonment), or torture.' b. Caucasians were more likely than non-Caucasians to report a traumatic response that 'someone else was physically injured.' Males were more likely than females to report a traumatic response that 'someone else was physically injured,' 'thought that one's own life was in danger,' and 'thought that someone else's life was in danger.' Females were more likely than males to report a traumatic response of 'personal feeling of helplessness.' c. Level of education was inversely correlated to MPQ DN. Age trended to inversely correlate with MPQ DN ($p = .055$), and level of education trended to inversely correlate with ISI ($p = 0.60$). d. There were no associations between demographics and trauma interference areas.	e. 'Personal assault' was associated with 'personal physical injury'. 'Combat, POW (or imprisonment), or torture' was associated with 'someone else was physically injured', 'thought that one's own life was in danger', and 'thought that someone else's life was in danger.' 'Accidents, illnesses, and natural phenomenon' was associated with 'someone else was physically injured' and 'thought that someone else's life was in danger.' f. Those who experienced 'combat, POW (or imprisonment), or torture' scored higher on ISI and MPQ total than those who did not. Those who experienced torture alone scored lower on MPQ VAS than those who did not. Those who experienced 'accidents, illnesses, and natural phenomenon' scored lower on PHQ-15 than those who did not. g. There were no associations between trauma type and trauma interference areas, either individually or collectively.	h. 'Personal physical injury' directly correlated with ISI and PSS score. 'Thought that one's own life was in danger' directly correlated with ISI, MPQ total, and PSS symptom score. 'Thought that someone else's life was in danger' directly correlated with ISI. i. 'Personal physical injury' was associated with 'fun &/or leisure activities interference'. 'Personal physical injury' trended with 'general life satisfaction' or 'overall functioning interference' ($p = .059$). Otherwise, there were no associations between traumatic response and trauma interference areas.	j. PHQ-9, PSS symptom score, and Ryff total directly correlated with all areas of interference. SF-36 directly correlated with all, except 'household duties, schoolwork, or work interference.' ISI directly correlated with 'fun &/or leisure activities interference' and 'general life satisfaction or overall functioning interference.' PHQ-15 and MPQ VAS correlated with only 'general life satisfaction or overall functioning interference.' MPQ total correlated with 'Fun &/or leisure activities interference.' MPQ DN did not correlate with any areas of interference.

Figure 2 Independent variables with their effects on downstream dependent variables.
Notes: Red font translates to no impairment, and green font translates to impairment. Bold font indicates positive or negative associations with downstream dependent variables and categories.

Table 25 PTSD Time-Series Analysis Summary

	Personal Assault	Combat	Accidents	Other	Self Was Injured	Another Was Injured	Thought That Own Life Was in Danger	Thought that Another's Life Was in Danger	Felt Helpless	Felt Terrified	ISI	PSS	MPQ DN	MPQ VAS	MPQ Total	PHQ- 15	PHQ- 9	Ryff Total	SF- 36	Household Duties, Schoolwork, or Work	Family Relationships, Friendships, or Sex Life	General Life Satisfaction or Overall Functioning	Fun &/or Leisure Activities									
Age													T																			
Race						X																										
Gender		X				X	X	X	X																							
Education level											T		X																			
Personal assault					X																											
Combat						X	X	X			X			[X] torture alone	X																	
Accidents						X		X								X																
Other																																
Self was injured											X	X											T	X								
Another was injured																																
Thought that own life was in danger											X	X			X																	
Thought that another's life was in danger											X																					
Felt helpless																																
Felt terrified																																
MPQ DN																																
MPQ total																															X	

(Continued)

Table 25 (Continued).

	Personal Assault	Combat	Accidents	Other	Self Was Injured	Another Was Injured	Thought That Own Life Was in Danger	Thought that Another's Life Was in Danger	Felt Helpless	Felt Terrified	ISI	PSS	MPQ DN	MPQ VAS	MPQ Total	PHQ- 15	PHQ- 9	Ryff Total	SF- 36	Household Duties, Schoolwork, or Work	Family Relationships, Friendships, or Sex Life	General Life Satisfaction or Overall Functioning	Fun &/or Leisure Activities	
MPQ VAS																							X	-
PHQ-15																							X	-
ISI																							X	X
SF-36																						X	X	X
PSS																					X	X	X	X
PHQ-9																					X	X	X	X
Ryff total																					X	X	X	X

Notes: X, statistically significant association/correlation; T, trend. Variables are as follows - age (years); race (Caucasian, Non-Caucasian); gender (Male, Female); education level (years); personal assault; combat, POW (or imprisonment), or torture ["combat" in Table 11]; accidents, illnesses, or natural phenomenon ["accidents" in Table 11]; other; self was physically injured ["self was injured" in Table 11]; someone else was physically injured ["another was injured" in Table 11]; thought that one's own life was in danger ["thought that own life was in danger" in Table 11]; thought that someone else's life was in danger ["thought that another's life was in danger" in Table 11]; personal feeling of helplessness ["felt helpless" in Table 11]; personal feeling of being terrified ["felt terrified" in Table 11]; general life satisfaction or overall functioning interference; fun and/or leisure activities interference; family relationships, friendships, or sex life interference; and household duties, schoolwork, or work interference. purple hue = demographics. blue hue = trauma types. green hue = traumatic responses. yellow hue = posttraumatic symptoms. orange hue = subjective interference areas.

Abbreviations: ISI, Insomnia Severity Index; PSS, Posttraumatic Stress Disorder Severity Scale; MPQ DN, McGill Pain Questionnaire Dot Number; MPQ VAS, McGill Pain Questionnaire Visual Analogue Scale; MPQ total, McGill Pain Questionnaire total; PHQ-9, Patient Health Questionnaire-9; PHQ-15, Patient Health Questionnaire-9; Ryff total score; SF-36 total score, Standard Form-36 total score.

PTSD symptoms with insomnia, pain symptoms, depression, somatization, psychological wellbeing, and quality of life supports the notion that posttraumatic manifestations include disturbed sleep (ie, PSS directly correlates with ISI), dysphoria (ie, PSS directly correlates with PHQ-9), somatization (ie, PSS directly correlates with PHQ-15 and MPQ total), in addition to anxiety, defensiveness, dissociation, and dysregulation (as seen in other reports).

Subjective Interference

Subjective interference followed a five-level gradation from Level 1 to Level 5: “fun and leisure activities” and “friendships” were impaired in 92.8% and 91.6%, respectively (ie, they are the least resilient) (Level 1), “general life satisfaction” and “overall functioning” were impaired in 89.2% and 81.9%, respectively (Level 2), “family relationships” and “sex life” were impaired in 79.5% and 75.9%, respectively (Level 3), “household duties” were impaired in 72.3% (Level 4), and “work” and “schoolwork” were impaired in only 61.4% and 47.0%, respectively (ie, they are the most resilient) (Level 5). This gradation essentially followed a hierarchy from hedonia (pleasure seeking) (loss occurring in more individuals) to eudaimonia (virtue seeking) (loss occurring in fewer individuals) (Figure 3). PTSD, as it has occurred longitudinally and cross-sectionally, often includes manifestations of anxiety, defensiveness, disturbed sleep, dissociation, dysphoria, dysregulation, and somatization. Except for somatization, these manifestations appear to overlap with DSM-5-TR PTSD diagnostic criteria. More research is needed regarding the character and course following trauma into its somatic domains. US Department of Defense and US Department of Veterans Affairs PTSD treatment guidelines recommend psychotherapy as first line for PTSD. Cognitive Behavioral Therapy (CBT) is as effective as pharmacotherapy for treating sleep disturbances in PTSD.¹⁶⁷ A lot of recent research has focused on underlying factors that affect one another and which factors may be the drivers for the manifestations of PTSD. Identifying a crucial event inflection point that significantly affects impairment would be useful for adapting and modifying therapy. The time between the onset of posttraumatic symptoms and impairment may be an ideal time to intervene.

Weaknesses of This Study are as Follows

- Data were obtained from individuals who were aware of and had volunteered to participate in a clinical trial for PTSD, raising the possibility of selection bias.
- Results were obtained from questionnaires that were based on subjective responses, having the potential for recall bias.

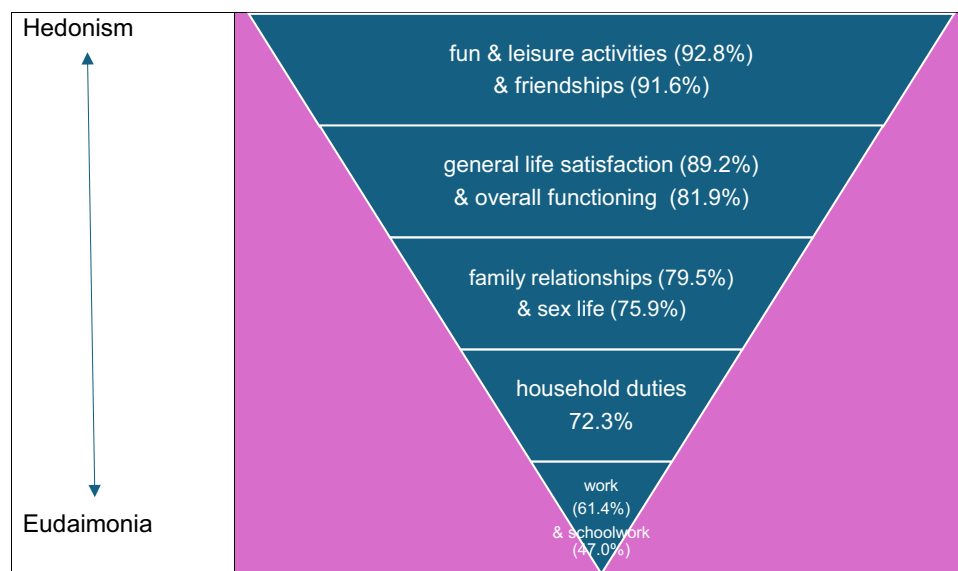


Figure 3 Relationship between driver of happiness and impairment.

Note: Subjective interference is considered as a surrogate for impairment.

- The data for this study was essentially collected cross-sectionally, for example, the first group of Veterans at time $t = 1$, the second group of Veterans at time $t = 2$, and so forth. What is known is that all Veterans had a diagnosis of PTSD at the time that their data was collected. That implies one or more traumas prior to the diagnosis and subjective impairment following the diagnosis. However, due to the cross-sectionality of this study, neither risk nor causality should be implied.
- For feasibility of analysis, trauma type was placed onto one of four groups. For three of the four groups, there were large numbers of veterans endorsing at least one trauma type in a particular group, with only small numbers of veterans not endorsing at least one trauma type in that particular group. The high number of different trauma types per veteran potentially confounded the results when trauma type as an independent variable was compared to traumatic response, posttraumatic symptoms, and subjective interference as dependent variables.
- This was a pilot study and as such a power analysis was not performed. Hence, for some of the comparisons, the existence of a type II error is considered. For example, there were several findings approaching statistical significance, yet not reaching statistical significance (eg, $0.05 < p < \text{or} = 0.10$), that might have reached statistical significance with a larger study. Those findings were included in [Tables 13, 15, 16, 18, 21, 22, and 23](#) for future work.
- The data for this study was obtained from Veteran's with PTSD. It might not be considered generalizable to other groups of individuals.
- Since this pilot study was for hypothesis generating more than hypothesis answering, then the results from this study should be considered preliminary and confirmed by additional adequately powered studies.

Conclusions

- When examining the time series of PTSD, there is a chronological sequence from demographics to trauma type, from trauma type to traumatic response, from traumatic response to posttraumatic symptoms, and from posttraumatic symptoms to subjective impairment.
- Qualitatively, demographics mostly affected trauma type and traumatic response, had little effect on posttraumatic symptoms (eg, the only statistically significant finding was that a higher level of education predicted a fewer number of somatoform painful locations), and had no effect on subjective impairment.
- Similarly, trauma type mostly affected traumatic response, had some effects on posttraumatic symptoms, and had no effect on subjective impairment.
- And, traumatic responses mostly affected posttraumatic symptoms and had little effect on subjective impairment (eg, the only statistically significant finding was that "Personal physical injury" predicted "Fun &/or leisure activities interference").
- Alternatively, posttraumatic symptoms had considerable effects on subjective interference across multiple different domains.
- Hence, along the time series of PTSD, there is a tendency for factors to affect those variables that are adjacent or proximal, but to not affect those variables that are more distant or further out. This preliminary finding requires further investigation.
- PSS correlated with all major subjective scale scores (ie, ISI, MPQ total, PHQ-9, PHQ-15, Ryff total, and SF-36).
- Quantitatively, there were no statistically significant associations between demographics as independent variables and PHQ-9 difficulty level, total number of different PSS trauma types, total number of different PSS traumatic responses, or total number of different PSS trauma interference areas as dependent variables. Quantitatively, there were multiple associations between trauma type and traumatic response as independent variables and total number of different PSS trauma types and total number of different PSS traumatic responses, as dependent variables, but there were no statistically significant associations between trauma type or traumatic response as independent variables and PHQ-9 difficulty level or total number of different PSS trauma interference areas as dependent variables.

- The finding that those who endorsed torture (as experienced or witnessed) had a higher pain threshold than those who did not endorse torture, was an unexpected finding, contradicting most other literature, and warrants further study.
- Also, the finding that those who endorsed “Accidents, illnesses, or natural phenomenon” (as experienced or witnessed) had lower degrees of somatization than those who did not endorse this group of trauma types warrants further study, as intentional traumas (eg, assaults) might predict more somatic complaints than unintentional traumas (eg, accidents).
- Demographics, trauma type, and traumatic response had no effect on subjective interference, other than “Personal physical injury” affecting “Fun &/or leisure activities” and “Personal physical injury” trending with “General life satisfaction or overall functioning interference”. Alternatively, posttraumatic symptoms had considerable effects on subjective interference across multiple different domains. Posttraumatic symptoms themselves, rather than demographic and trauma factors, are essentially the drivers of subjective interference, which is agreeable with a symptom-oriented approach in clinical and research settings.
- There was association between psychological trauma and somatic manifestations, while there was dissociation between physical injury and somatic manifestations. And fear of injury was more predictive of pain than experience of injury. Of the posttraumatic symptoms, those that were psychological had major effects on subjective impairment, whereas those that were physical had only minor effects. To illustrate, the more psychologically laden scales (eg, PHQ-9, PSS, Ryff total, and SF-36) were associated with relatively greater subjective interference than the more physically laden scales (eg, MPQ total, MPQ DN, MPQ VAS, ISI, and PHQ-15). Hence, psychoform factors might potentially drive many of the posttraumatic symptoms, and psychologically based symptoms might potentially drive many of the impairment types.
- Subjective impairment occurred in such a manner that pleasure seeking activities were impaired first and altruistic activities were impaired last.

Future Work

- We found that higher levels of education are protective against pain symptoms, and higher levels of education are protective against insomnia (by trend) in individuals with PTSD. This raises a question for future work – might creativity and learning decrease somatic symptoms, including pain and insomnia, in individuals with PTSD?
- Combat was not associated with “personal physical injury”, but it was associated with “someone else was physically injured”. This raises a question for future work – is there potential for a therapeutic implication focusing outward away from self and eudemonic instead of inward toward self and hedonic?
- Perceived &/or real discrimination is directly proportional to degree of PTSD symptoms.^{168–173} And from this study, fear of injury to oneself predicted posttraumatic pain symptoms, whereas actual injury to oneself did not. Also, fear of bodily injury predicted later bodily pain, but actual bodily injury did not. These raise a question for further study – does fear, programmed by past experiences, such as bullying, harassment, prejudice, and social media, prime the psyche and create an anticipatory state, where individuals with such priming are prone to posttraumatic symptomatology, especially somatic symptoms, in comparison to those without such priming?
- Traumatic responses, including fear and/or helplessness, were essentially fundamental PTSD experiences. This raises questions for clinical and research purposes – what are the relationships between trauma type and traumatic response, and what are the relationships between traumatic response and posttraumatic symptoms?
- Each of the four categories of subjective interference was associated with higher PSSs. This suggests a relationship between PTSD symptom severity and subjective interference. This raises a question for future work – might insight-oriented therapy focusing on the manner in which posttraumatic symptoms affect life interference have an effect aimed at mitigating both domains?
- Further corroboration is needed to verify which psychoform factors of traumas and traumatic responses are a driving force, over somatoform factors, predicting what types of posttraumatic symptoms, then verifying which

psychologically based posttraumatic symptoms are a driving force, over physically based posttraumatic symptoms, leading to what types of impairment.¹⁷⁴

Ethics Statement

The Phoenix Veterans Administration (VA) Institutional Review Board (IRB), Phoenix AZ, provided ethics approval for the current study. Informed consent was obtained from each study participant. The guidelines outlined in the Declaration of Helsinki were followed.

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Disclosure

The authors report no conflicts of interest in this work.

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