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The Prevalence of Posttraumatic Stress Disorder in Primary Care: A Systematic Review

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Abstract

Background—There is limited information on the prevalence of posttraumatic stress disorder (PTSD) across primary care settings.

Objective—Determine the prevalence of clinician-diagnosed PTSD and questionnaire-ascertained PTSD symptoms in primary care patients.

Methods—A systematic review of the literature using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) method, searching MEDLINE, CINAHL, Cochrane Database, PsychINFO, EMBASE, Google Scholar, and relevant book chapter bibliographies. Studies that reported on the prevalence, including point and/or lifetime prevalence, of PTSD ascertained using diagnostic interviews, self-report questionnaires, or from administrative data, among patients seen in primary care were deemed eligible for inclusion. We abstracted data on the PTSD assessment tool, the mean questionnaire scores/cutoff scores, the time period of PTSD symptoms, and PTSD prevalence reported.

Results—Of 10,613 titles screened, 41 studies were eligible for inclusion. The included studies assessed PTSD in a total of 7,256,826 primary care patients. The median point prevalence of PTSD across studies was 12.5%. The point prevalence of the civilian population median was 11.1%, the special risk population median was 12.5%, and the veteran median was 24.5%. The point prevalence of diagnostic interview-ascertained PTSD ranged from 2% to 32.5%, the point

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Amendments: This protocol is the original protocol developed by the authors.

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prevalence of questionnaire-based substantial PTSD symptoms ranged from 2.9% to 39.1%. Lifetime prevalence of diagnostic interview ascertained-PTSD ranged from 14.5% to 44.3%. The prevalence of PTSD in administrative data-based studies ranged from 3.5% to 48.8%.

Conclusions—PTSD is common in primary care settings. Additional research on effective and generalizable interventions for PTSD in primary care is needed.

Keywords

Health Services Needs and Demand; Prevalence; Primary Health Care; Stress Disorders; Post-Traumatic

Introduction

Posttraumatic stress disorder (PTSD) is a psychiatric illness first recognized in war veterans and later more widely recognized in those who experience other traumas, including abuse or assault, traumatic injuries and life-threatening illnesses.¹⁻³ Individuals with PTSD actively suffer from severe psychiatric symptoms which impair functioning such as panic attacks when confronted with reminders of the trauma.⁴ Diagnostic criteria for PTSD include an exposure to an actual or threatened death, serious injury, or sexual violence in the following ways: direct experience, witnessing, learning about traumatic events that occurred to close family or friends, or experiencing repeated or extreme exposure to aversive details of the traumatic events. Over a period of 4 weeks they experience a constellation of symptoms including intrusive symptoms (including flashbacks, nightmares and intrusive thoughts of the incident), avoidant behavior (avoiding situations, people, stimuli that remind them of the traumatic event), negative mood (which can include self-blame for the traumatic incident, isolation and detachment), and alterations in arousal (including hypervigilance, exaggerated startle response, poor sleep and concentration).⁴

According to the National Comorbidity Survey Replication (NCS-R), one of the largest epidemiological studies of mental disorders performed in the United States general population, the lifetime prevalence of PTSD in adults is 6.8% and the annual prevalence is 3.5%.^{5,6} Adverse experiences in childhood are one example of events that can result in later symptoms of PTSD. Primary care patients have a high prevalence of adverse childhood experiences (ACEs), leading to increased physical illness burden.⁷ About 25-30% of those who experience traumatic events such as those measured by the ACEs study develop PTSD.⁸

Although there is a high prevalence of traumatic event exposure among primary care patients and collaborative care interventions have been developed for the successful treatment of common mental disorders in primary care settings,^{9,10} there remains a need for information on the overall prevalence of PTSD across primary care settings. Understanding the rates of PTSD in primary care settings can facilitate the selection and use of a standard screening tool (such as the PC-PTSD-5)¹¹ and clinically useful algorithms for patients with PTSD served in primary care clinics. Effective screening tools and treatment protocols for stepped care¹² models are especially important in light of increased behavioral health integration efforts in primary care settings across the U.S.

The present systematic review quantifies what is known about the prevalence of PTSD in primary care settings to help clinicians and researchers have a benchmark with which to compare the prevalence of the populations that they are working (both for screening and treatment purposes). While a recent review article addressed this topic,¹³ to our knowledge this is the first systematic review article with the scope and breadth to capture relevant studies for inclusion. The present report documents the results of a systematic review of studies examining PTSD in primary care settings. Our objective was to obtain an accurate estimate of PTSD in various adult primary care populations in the existing literature. We sought to review both the prevalence of administrative data documented PTSD and questionnaire-ascertained clinically meaningful PTSD symptoms in primary care patients.

Methods

Approach

A systematic review was performed using the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) method.¹⁴

Search Strategy

Databases searched included MEDLINE (using MeSH terms and a general search), CINAHL, Cochrane Library, PsychINFO, EMBASE, Google Scholar, and relevant book chapter bibliographies. The following search terms and strategy was used: (“Traumatic stress” or PTSD or posttraumatic or “posttraumatic stress disorder” or trauma or “post traumatic” or “post-traumatic”) AND (“primary care” or PCP or “patient centered medical home” or “internal medicine” or “family medicine” or “general practice” or “obstetrics and gynecology” or “ob/gyn” or “primary health care” or “primary healthcare”) AND (prevalence). This search included MeSH terms PTSD, Primary Healthcare, Patient Centered Medical Home, Internal Medicine, Family Medicine, and Obstetrics and Gynecology, each of which map onto similar terms to expand the search in the MEDLINE database.

The databases were searched from January 1980 when the diagnosis of PTSD was first included in the Diagnostic and Statistical Manual of Mental Disorders-III (DSM-III), to January 2016 (date last searched). Authors MS and HH screened titles and abstracts as well as reviewed the full text of eligible articles. If data within the articles were unclear original study authors were contacted for clarification.

Eligibility Criteria

Inclusion criteria comprised original articles in English reporting the prevalence, including point and/or lifetime prevalence, of PTSD among patients seen in a primary care setting. Primary care was defined as first contact medical care (family practice, internal medicine, obstetrics-gynecology clinics). We included articles in which PTSD was ascertained using diagnostic interviews, self-report questionnaires, or from medical record diagnoses.

Articles were excluded if they contained duplicate data sources with other articles (so as not to over-represent one primary care sampled population), if the topic was found not to be directly relevant, if the study was not primary care-based, or if the population studied was

not representative of the entire primary care population at the study site(s). We also excluded abstracts, case reports/case series and review articles.

Study records

Initial titles were screened by one author (MS) and selected abstracts were screened by two independent reviewers/authors (MS and HH). Studies were selected for inclusion if two authors agreed that they clearly met eligibility criteria. The prevalence of PTSD was the main outcome of interest and was examined based on different sub-groups including general primary care, veterans in primary care, and special risk populations in primary care (e.g. refugees and immigrants). Additional outcomes of interest included type of diagnostic or screening tool used and sample characteristics. The diagnostic or screening tools were important to better understand potential differences in PTSD prevalence and the sample characteristics were important to examine potential trends in various prevalence levels (e.g. elevated rates of PTSD in primary care veteran populations).

The abstracted data from each study was collected into a data collection spreadsheet accessible to both authors involved in this process (MS and HH). Abstracted data included primary care population sample characteristics (location, clinic site, urban/rural, mean age, population type, gender, race, study design, and number of participants in the sample), and results (PTSD prevalence, PTSD ascertainment tool, mean questionnaire scores and cutoff scores [if relevant], time period of symptoms measured, and number of participants that completed PTSD assessment).

Risk of bias

Articles were assessed for risk of bias using an adapted risk of bias screen developed by Hoy et al.,¹⁵ which has been used in other systematic review articles.¹⁶ The Hoy bias tool was modified to screen for bias based on the studies representation of a primary care sample rather than a national population. Articles were ranked for risk of bias by two authors (MS and HH) independently. Articles were assigned a low, medium, or high risk of bias with 9 representing little bias and 0 representing a high risk of bias. Low risk of bias was assigned if the article contained 7-9 items on the risk of bias screen, moderate risk if the article contained 3-6 items, and high risk if the article contained 0-2 items. The risk of bias information was provided in the results section with authors noting any trends in bias score and prevalence rates.

Because of the diversity in primary care, quantitative synthesis was not appropriate for this systematic review. Median PTSD prevalence was calculated using a median calculator in order to summarize the data.

Results

Of 10,613 titles screened, 89 full-text articles were assessed for eligibility. Forty-one studies were included in the qualitative synthesis (see Figure 1). General sample characteristics are described in Table 1 while results are found in Table 2. Studies were conducted in the following countries: Canada (1), Italy (1), Israel (2), Lithuania (1), Puerto Rico (1), Qatar (1), South Africa (2), Spain (1), Sweden (1), Switzerland (1), and the United States (29).

Study designs included 30 cross-sectional studies and 11 retrospective reviews of the medical records.

The point prevalence of PTSD diagnosis ascertained by diagnostic interviews (e.g., Structured Clinical Interview [SCID], Diagnostic Interview Schedule [DIS], Composite International Diagnostic Interview [CIDI], Mini-international Neuropsychological Interview [MINI], Clinician-Administered PTSD Scale [CAPS]) ranged from 2% to 32.5% (17 studies^{18, 20, 23-25, 28, 30-32, 35, 37, 39, 41, 43-45, 58}). The point prevalence of substantial PTSD/clinically important PTSD symptoms based on questionnaire thresholds ranged from 2.9% to 39.1% (15 studies^{17, 19, 21, 22, 26, 27, 33, 38, 40, 42, 46, 53, 29, 34, 36}). The median point prevalence of PTSD in all primary care samples was 12.5% (civilian population median [N = 21]: 11.1%, special risk population median [N = 3]: 12.5%, and veteran median [N = 7]: 24.5%).

The prevalence of PTSD in administrative data-based studies ranged from 3.5% to 48.8% (11 studies^{25, 47, 48, 51, 52, 54, 25, 50, 55-57}). Finally, the lifetime prevalence of PTSD diagnosis based on diagnostic interviews ranged from 14.5% to 48.7% (6 studies^{18, 20, 23, 25, 44, 58}).

Several potential risk factors for PTSD in primary care populations were identified. In studies reporting separate results for PTSD point prevalence for men and women, women were more likely to have PTSD in civilian populations,^{20, 31} while men were more likely to have lifetime PTSD in one veteran population.⁵² Populations with known prior exposure to violence generally had higher rates of PTSD than those without prior exposure to violence.³⁸

The PTSD Checklist (PCL) (6 studies)^{17, 22, 26, 38, 46, 53} and the Composite International Diagnostic Interview (CIDI) (6 studies)^{20, 23, 25, 30, 37, 44} were the diagnostic tools most often used. The PCL is a screening measure while CIDI is a structured clinical diagnostic interview. Risk of bias in all studies remained medium to low (reported individually in Table 2) and trends in a relationship between bias score and prevalence rate were not apparent.

Discussion

This systematic review highlights several key features of PTSD in primary care settings. First, the point prevalence of PTSD was much higher than the one-year general population prevalence of PTSD found by the NCS-R⁶ indicating that primary care is an especially important setting in which to identify and manage PTSD.

Additionally, there was a very wide range in the prevalence of PTSD found in the included studies, similar to the wide range found by Greene et al.¹³ Greene et al. note that the significant heterogeneity apparent in their findings was a result of “samples with different levels of trauma exposure.”¹³ Another reason for this heterogeneity may be that populations could have trauma exposure but have sufficient protective factors (e.g. secure attachment relationships to process the traumatic experiences)⁶¹⁻⁶³ mitigating the risk for development of PTSD symptoms. Additionally, many people who experience trauma and suffer from mental health effects of trauma do not fit the criteria for PTSD (e.g. chronic childhood abuse experiences, ongoing domestic violence experiences).¹ Our findings suggest that level of trauma exposure specific to the diagnosis of PTSD is likely one factor contributing to this

heterogeneity as studies of veterans generally had higher PTSD reported (median 24.5%) than those of civilians (median 11.1%) or special risk (refugee/immigrant) primary care samples (median 12.5%). We additionally identified several reasons that may account for this range, including varying methods of case ascertainment (various scales with different cut off scores, structured interviews, and chart reviews) or unmeasured differences between study populations (e.g. location, age, other untracked demographic factors, or selection factors [patient refusal rates, random versus consecutive sampling]).

Specific risk factors identified for various populations include women being more likely to have PTSD in civilian populations. This finding might suggest that women experience more trauma than men in civilian populations (e.g. are more often subject to domestic violence), or have less access to protective factors. Men were found to have more lifetime PTSD in one large veteran population study; the timeframe of PTSD symptoms might be important to consider (e.g. veterans may return from combat without expressing PTSD symptoms which may develop later in life). It makes intuitive sense that populations with known prior exposure to violence were generally found to have higher PTSD prevalence.

We assessed for meaningful differences of methodology and found that diagnostic interview and questionnaire threshold PTSD diagnosis studies exhibited very similar ranges, suggesting that questionnaires might be similarly effective in identifying PTSD when compared to diagnostic interviews. Median PTSD prevalence was calculated to summarize the data with the caveat that individual primary care clinics may be best served to find studies examining populations with characteristics similar to themselves in order to estimate their PTSD prevalence.

The findings reveal that although primary care PTSD prevalence reports vary greatly, PTSD in this setting is common (regardless of the type of population [i.e., civilians versus veterans]) with the median prevalence approximating that of depression.^{64, 65} Given the growing understanding of mental and physical adverse effects of traumatic stress,^{7, 66, 67} it is important to use a standard screening tool, and then develop clear and feasible clinical guidelines based on the available evidence, with regards to the management of PTSD in the primary care setting. A systematic review of PTSD interventions in medical settings is needed to help further our understanding of evidence-based PTSD management.

Although guidelines for depression treatment in primary care settings have been developed, relatively few guidelines have been designed to address the management of PTSD in primary care. In the U.S., a pragmatic treatment algorithm exists with guidelines for mental health prescribers for treating PTSD and is based on a literature review and the experience within one practice setting,⁶⁸ however, this is not a primary care-based program nor has it been tested in primary care or for use by non-mental health specialists.

The collaborative care model or other primary care interventions may have the potential of addressing the treatment needs of those with PTSD in primary care settings. The effectiveness of collaborative care treatment for depression in primary care is well established.^{69, 70} There is some preliminary evidence including three randomized controlled trials indicating that collaborative care may be an effective intervention for PTSD in primary

care,^{10, 71-74} and some evidence that other interventions in primary care may be equally or more effective than collaborative care.^{75, 76} One randomized controlled trial found that patients who attended eight cognitive processing therapy (CPT) sessions in addition to usual care by a primary care clinician had equal improvement to patients who received extensive telemedicine collaborative care interventions.⁷¹ This finding might reflect that patients who are able to tolerate eight therapy sessions are a self-selecting population who is more able to engage in treatment, or it might indicate that therapy is the mainstay of treatment for PTSD. Another randomized controlled trial found that patients receiving a “minimally enhanced usual care intervention” consisting of primary care clinician education about “trauma, PTSD, and evidence-based psychopharmacology” resulted in improvement greater than those receiving a more traditional and resource intensive collaborative care intervention.⁷⁶ This surprising finding may indicate that treatment with a provider whom the patient is comfortable and has an already-established relationship is more successful than more intensive treatment with a new team, and suggests that psychoeducation and medication education for primary care physicians may be a cost effective method of treating patients with PTSD. However, decreased PTSD symptoms were noted for all groups in the study, and improvements in the “minimally enhanced usual care” group were not overwhelmingly different than the collaborative care group.⁷⁶ It seems that attention to this diagnosis is likely helpful, and that researchers have yet to determine the specific clinical treatment that works best. Given the high prevalence of PTSD in primary care and the lack of specialty mental health providers to adequately manage PTSD, more studies of types of collaborative care or other interventions for this condition in primary care settings are needed to better understand how to optimally meet the needs of this population. Trauma expert Judy Herman offers the following general guideline “[t]he core experiences of psychological trauma are disempowerment and disconnection. Recovery, therefore, is based upon the empowerment of the survivor and the creation of new connections. Recovery can take place only within the context of relationships; it cannot occur in isolation.”¹ Researchers and clinicians may need to shift from focusing on individual patient treatment to facilitating greater psychological connections for these patients.

Neglecting mental health treatment for this population may make common medical conditions more difficult to manage. For instance, the original ACEs study showed a direct relationship between high numbers of adverse childhood experiences and increased risks for liver disease, ischemic heart disease, cancer, chronic lung disease, and skeletal fractures.⁷ While adverse events do not always result in PTSD this is an example of how emotional adversity correlates with long-term physical illness. A recent study showed that women with PTSD have nearly twice the likelihood of developing Type-2 diabetes.⁶⁶ Furthermore, women with increased PTSD symptom severity were found to have a 104% increase in healthcare costs versus women with low severity of PTSD symptoms or those with no symptoms.⁶⁷

While there are not yet studies of interventions for PTSD treatment that have shown a decrease in burden of physical disease, the collaborative care literature points to the benefit of addressing physical comorbidities with specific psychiatric diagnosis. The depression literature reveals that a collaborative care intervention targeting depression, glucose control in diabetes, hypertension and hyperlipidemia led to improvement in all outcomes.⁷⁷ The

Improving Mood-Promoting Access to Collaborative Treatment (IMPACT) trial found that geriatric patients with depressive disorders receiving the collaborative care intervention had improved depression physical functioning⁷⁸ and had reduced costs due to hospitalizations for medical illnesses.⁷⁹ In a secondary analysis of the Communication and Low Mood (CALM) trial, the authors reported that treatment of anxiety improves self-reported physical functioning as measured by the twelve-item Short Form Survey (SF-12) (included here with the caveat that outcome assessment was manipulated in order to yield a significant finding).⁸⁰

Primary care providers have the capacity to fill the gap between mental health need and mental health care availability.⁷⁶ Primary care providers can use a screening tool such as the PTSD symptom checklist-civilian (PCL-C, 17 questions) or the PC-PTSD (4 questions) (both showed >80% sensitivity and specificity)³¹ to help identify possible PTSD in patients presenting with symptoms of anxiety or depression who have a history of trauma exposure. Following a positive PTSD screen and warranted diagnostic assessment to confirm a positive screen, primary care providers can prescribe prazosin for nightmares, serotonin reuptake inhibitors (paroxetine and sertraline are the only medications that are FDA approved for PTSD treatment) and/or venlafaxine as evidence-based options that have been shown to have efficacy for PTSD, and refer for appropriate therapy if the patient is agreeable to this intervention.⁶⁸ Additionally, the United Kingdom National Institute for Health and Clinical Excellence (NICE) PTSD guidelines suggest trauma focused psychological therapy for all following a positive screen, prior to prescribing medications.⁸ Access to these therapies likely varies greatly between primary care clinical sites. Mental health providers are increasingly integrated into primary care sites and can be part of a “stepped care” model for patients who do not respond to initial interventions offered by primary care clinicians.⁸¹ Future studies should consider using a standardized screening tool, such as the PC-PTSD used in VA healthcare.

This review has several limitations. Despite efforts to comprehensively review multiple databases, relevant articles may have been missed due to inconsistent indexing in electronic databases. Articles not written in English were excluded due to difficulties accessing and/or translating findings, further increasing the risk of missing relevant articles and making this review more applicable to populations served by English speaking clinicians. Included studies had varying designs and therefore multiple methodological limitations. Ranges and medians of PTSD prevalence rather than means are reported due to the great variation in study designs, limiting generalizability of findings. Therefore, clinicians may be best served by reviewing the studies included that have similar demographics to those at their practice sites. The major strength of this study is the extensiveness of the search methodology. While the previously carried out Greene¹³ study had a similar focus to the present study, our study is significantly more systematic, including not just two databases but five; using MeSH terms to include more in the search results, and having a longer overall timeframe.

Conclusion

This systematic review identified that the prevalence of PTSD in primary care settings is varied greatly, ranging from 2% to 39.1%, but with a median point prevalence of 12.5%,

similar to that of depression. Establishing a median prevalence is important for those working with primary care populations as they will be able to practically compare their clinic prevalence with one that might be expected, and target screening and/or treatment interventions accordingly. In light of the public health costs of PTSD, additional research is needed to examine and explore optimal management of PTSD in primary care settings, given the growing literature on this topic.

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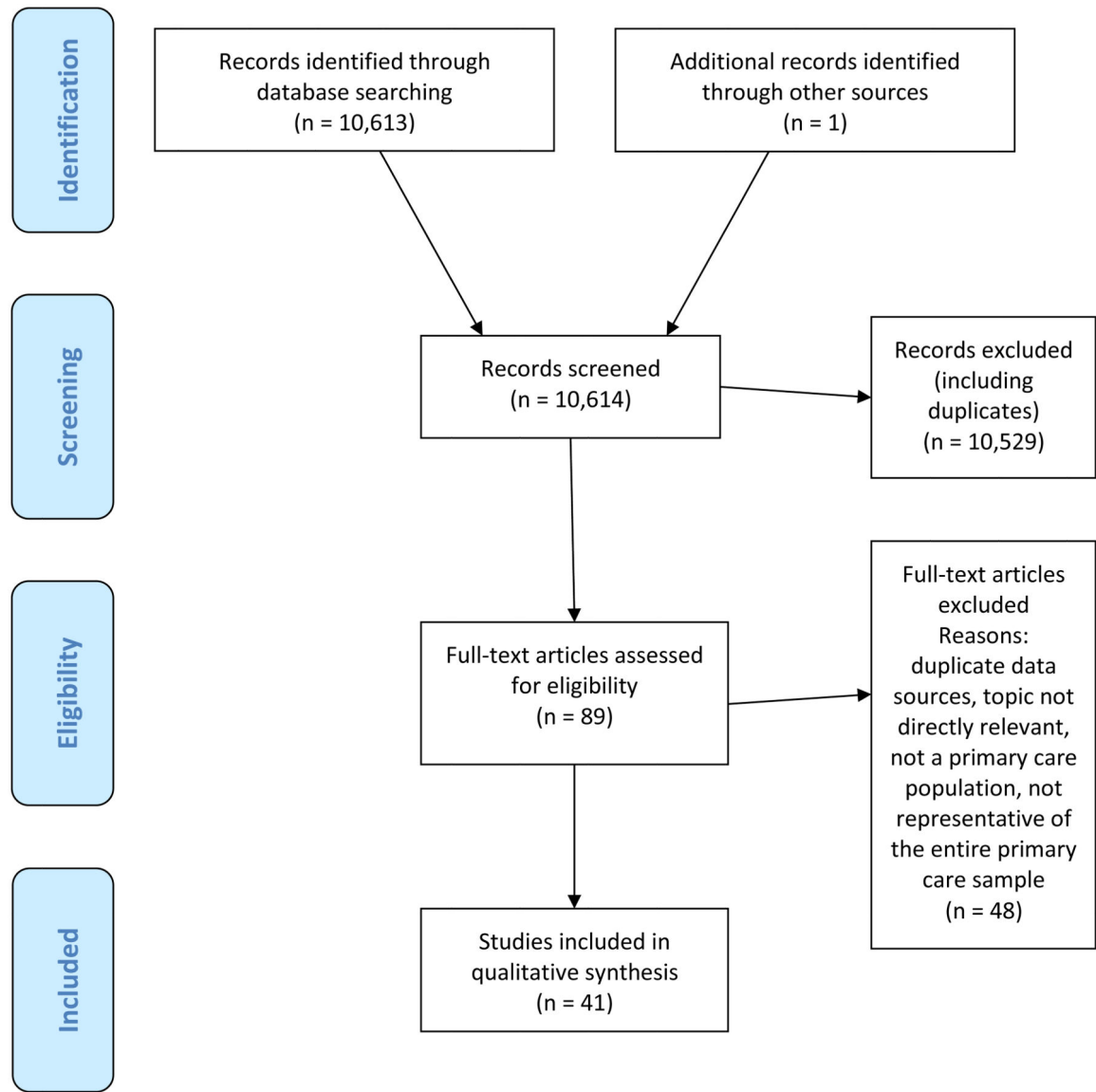


Figure 1. PRISMA¹³ flow diagram of article selection

Table 1

Sample characteristics of PTSD in primary care reviewed studies

Study	Location	Site affiliation	Urban/Rural	Mean age (SD)	Population type	Gender	Race	Risk of bias*	Study design	N of enrolled sample (as reported)
General Primary Care										
Stein et al. (2000) ¹⁷	San Diego, California, USA	Academic primary care	Urban	36.9 (SD not provided)	Civilian	56.5% female	61.1% Caucasian; 12.5% Filipino; 8.2% Latino/Hispanic; 7.6% Asian American; 4.1% African American	M	Cross-sectional	762 eligible
Applegate (2001) ¹⁸	Louisiana, USA	Academic primary care	Urban	46.4 (SD 13.8)	Low-income	81% female	74.2% African American; 25% Caucasian; 1% other	M	Cross-sectional	433 enrolled
Taubman-Ben-Ari et al. (2001) ¹⁹	Israel	Non-academic primary care	Not reported - Israel is 91% urban	51.4 (SD 17.8)	Israelis	60% female	Israeli	L	Retrospective review of medical records	2975 enrolled
Carey et al. (2003) ²⁰	South African township	Non-academic primary care	Urban	31.1 (SD 10.77)	"Poor urban community"	61.2% female	Xhosa township historically segregated for black Africans only	M	Retrospective review of medical records	220 enrolled
Thulesius et al. (2004) ²¹	Sweden	Non-academic primary care	Both	46.6 (SD 15.2)	Civilians in Sweden	60% female	Not reported	L	Cross-sectional	1378 enrolled
Gillock et al. (2005) ²²	New Hampshire, USA	Academic primary care	Rural	41.91 (SD 10.45)	Civilian	69% female	95% Caucasian	M	Cross-sectional	627 approached
Gomez-Benevto et al. (2006) ²³	Valencia, Spain	Non-academic primary care	Urban	44 (SD 17)	Civilian	66% female	Not reported	L	Cross-sectional	331 enrolled
Kroenke et al. (2007) ²⁴	12 states, USA	Non-academic primary care	Not reported	47.1 (SD 15.5; range 18-87 years)	Civilian	69% female	81% non-Hispanic White; 7% Black; 9% Hispanic; 3% other	L	Cross-sectional	2982 invited
Liebschutz et al. (2007) ²⁵	Boston, Massachusetts, USA	Academic primary care	Urban	42 (SD 11.3)	Civilian	51% female	59% Black/African American; 19% White; 8% Hispanic/Latino; 14% other	M	Cross-sectional	621 enrolled
Peltzer et al. (2007) ²⁶	South Africa	Non-academic primary care	Rural	31.1 (SD 11.8)	Population in a developing setting	76% female	100% Black African	L	Cross-sectional	250 enrolled
Cwikiel et al. (2008) ²⁷	Israel	Non-academic primary care	Not reported - Israel is 91% urban	30.6% age 25-44; 42.8% age 45-64; 26.5% age 65-75	Civilian	65.2% female	Not reported	L	Cross-sectional	77% of those eligible included
Fedovskiy et al. (2008) ²⁸	Atlanta, Georgia, USA	Academic primary care	Urban	38.5 (SD 11.4)	Women who are low income, uninsured, relatively low level of education	100% female	100% Latina	M	Cross-sectional	Not reported
Fogarty et al. (2008) ²⁹	Boston, Massachusetts, USA	Academic primary care	Urban	68.8% age 18-44	Civilian	61.1% female	46.8% Black	L	Cross-sectional	72% response rate

Study	Location	Site affiliation	Urban/Rural	Mean age (SD)	Population type	Gender	Race	Risk of bias*	Study design	N of enrolled sample (as reported)
Duran et al. (2009) ³⁰	Albuquerque, New Mexico, USA	Non-academic primary care	Urban and 5 tribes	18-45 years of age	American Indian women	100% female	100% American Indian	M	Cross-sectional	396 enrolled
Freedly et al. (2010) ³¹	Southeastern USA	Academic primary care	Both	Men 45.1% age 18-44, women 55.3% age 18-44	Civilian	82.5% female	65% White, 35% African American or other	M	Cross-sectional	519 enrolled
Gaynes et al. (2010) ³²	Chapel Hill, North Carolina, USA	Academic primary care	Urban	45.2 (SD 15.4)	Civilian	70.9% female	66.9% White, 28.4% African American, 4.6% other	L	Cross-sectional	723 enrolled
Wrenn et al. (2011) ³³	Atlanta, Georgia, USA	Non-academic primary care	Urban	37 (range 18-74)	Inner city	67% female	94% African American	M	Cross-sectional	58% of those approached included
Vera et al. (2012) ³⁴	San Juan, Puerto Rico	Non-academic primary care	Urban	42.9 mean; 33.1% 18-35; 32.7% 36-50; 34.2% 51-65	Civilian	79.4% female	Puerto Rican and Dominican	L	Cross-sectional	93% of those approached agreed to participate
Bunevicius et al. (2014) ³⁵	Lithuania	Non-academic primary care	Urban	50 (SD 19)	Civilian	68% female	Lithuanian	L	Cross-sectional	1170 approached
Preville et al. (2014) ³⁶	Quebec, Canada	Non-academic primary care	Both	73.2 (SD 6.1)	Civilian	57.3% female	Quebecois	L	Cross-sectional	1811 agreed
Bener et al. (2015) ³⁷	Qatar	Non-academic primary care	Urban	37.8% aged 35-49	Civilian	56.3% female	Qatari nationals	L	Cross-sectional	2000 approached
Special Risk (Refugee/Immigrant)										
Eisenman et al. (2003) ³⁸	Los Angeles, California, USA	Non-academic primary care	Urban	46.1 (SD 24.7)	Primarily uninsured Latino population	75.3% female	100% Latino: 41.5% from Mexico; 32.5% from El Salvador; 17.7% from Guatemala; 8.3% from "other" (Honduras, Nicaragua, Cuba, and South America)	M	Cross-sectional	1287 approached
Eytan et al. (2007) ³⁹	Geneva, Switzerland	Academic primary care	Urban	30 (SD 11)	Asylum seekers in Switzerland	26% female	58% African; 37% European; 5% Asian	L	Cross-sectional	107 enrolled
Aragona et al. (2013) ⁴⁰	Rome, Italy	Non-academic primary care	Urban	37.58 (SD 11.45)	New Immigrants to Italy	39.65% female	100% first generation immigrants from: Asia (22.1%); Africa (28.2%); Latin America (6.7%); Eastern Europe (43.1%); Romania (30.9%); China (7.4%); Bangladesh (6.1%)	L	Cross-sectional	412 enrolled
Veteran										
Dobie et al. (2002) ⁴¹	Puget Sound, Washington, USA	VA system	Urban	48 (SD 13.7)	Veteran	100% female	74.5% White; 9.2% Black; 14.9% other	L	Cross-sectional	1794 invited
Mori et al. (2003) ⁴²	Boston, Massachusetts, USA	VA primary care	Urban	64	Veteran	2.2% female	77% Caucasian	M	Cross-sectional	313 enrolled

Study	Location	Site affiliation	Urban/Rural	Mean age (SD)	Population type	Gender	Race	Risk of bias*	Study design	N of enrolled sample (as reported)
Prins et al. (2003) ⁴³	Palo Alto and Menlo Park, California, USA	VA primary care and women's health	Urban	52.1 (SD 15.8)	Veteran	66% female	68.6% Caucasian; 17.8% African American; 4.3% Hispanic; 4.9% Asian/Pacific American; 1.1% Native American; 3.2% Other	M	Cross-sectional	335 enrolled
Escalona et al. (2004) ⁴⁴	New Mexico, USA	VA primary care	Urban	23-85 years	Women veterans, with non-veteran spouses as controls	100% female	46% White; 30% Hispanic; 3% American Indian or Alaskan Native; 3% Black; 2% Asian or Pacific Islander; 1% Hispanic Black; 15% not reported	M	Retrospective	601 approached, 334 enrolled
Magruder et al. (2005) ⁴⁵	Charleston and Columbia, South Carolina; Tuscaloosa and Birmingham, Alabama, USA	VA primary care	Urban clinics covering populations of several southern states	60.9 (SD 12.1)	Veteran	7.9% female	61% White	L	Cross-sectional	1198 enrolled
Spiro et al. (2006) ⁴⁶	Boston, Massachusetts, USA	VA system	Urban	Not reported	Veteran	0% female	Not reported	L	Cross-sectional	6829 patients approached 2425 enrolled
Seal et al. (2007) ⁴⁷	USA	VA system	Not reported	26% age 18-24; 28% age 25-29; 22% 30-39; 24% 40	Veteran	13% female	69% White; 18% Black; 11% Hispanic; 2% other	M	Retrospective review of medical records	165,351 screened
Funderburk et al. (2008) ^{48, 49}	USA	VA primary care	Both	62 (SD 16)	Veteran	4% female	93% White	M	Retrospective review of medical records	86,326 screened
Kinder et al. (2008) ⁵⁰	White River Junction, VT; Richmond, VA; Birmingham, AL; Little Rock, AK; Los Angeles and San Francisco CA; and Seattle, WA, USA	VA primary care	Both	64 (SD 12)	Veteran	~4% female	~73% White	M	Retrospective review of medical records and self-report	35,715 screened
Andersen et al. (2010) ⁵¹	Upstate New York, USA	VA primary care	Both	68% ages 20-29	Veteran	11% female	85% White; 8% Black; 3% Hispanic; 2% other; 1% unknown	L	Retrospective review of medical records	4416 screened
Haskell et al. (2010) ⁵²	Connecticut, USA	VA primary care and women's health	Both	32 (SD not reported)	Veteran	19% female	11% Black; 64% White; 25% other	M	Retrospective review of medical records	1129 screened
McDevitt-Murphy et al. (2010) ⁵³	Memphis, Tennessee, USA	VA primary care	Urban	34.5 (SD 9.4)	Veteran	9.9% female	62.3% White; 35.1% Black/African American	M	Cross-sectional	74% response rate
Zivin et al. (2010) ⁵⁴	USA	VA primary care	Both	63.8 (SD not reported)	Veteran	5% female	58% White; 12% "nonwhite"; 30% unknown	M	Retrospective review of medical records	2,536,727 screened

Study	Location	Site affiliation	Urban/Rural	Mean age (SD)	Population type	Gender	Race	Risk of bias*	Study design	N of enrolled sample (as reported)
Mitchell et al. (2014) ⁵⁵	Boston, MA, USA	VA primary care	Urban	52.12 (SD 17.12)	Veteran	100% female	54.5% Cau; 18.7% Af. Am; 1.4% Hisp/Lat; 1.8% Asian; 1.0% Native American/Pac. Islander; 22.5% unknown	M	Retrospective review of medical records	492 screened
Mohanty et al. (2015) ⁵⁶	USA	VA primary care	Both	Age at first VA visit 18.6-61.3yo	Veteran	100% female	~40% Cau; 19% Af. Am; 10% Hisp/Lat; 6.6% unknown	M	Retrospective review of medical records	78,435 screened
Trivedi et al. (2015) ⁵⁷	USA	VA primary care	Both	57.3 (SD 13.8) if any mental illness	Veteran	8.5% female if any mental illness	72.3% Cau; 19.7% Af. Am; 1.0% Hisp/Lat; 2.9% other; 4.2% unknown if any mental illness	M	Cross-sectional	4,461,208 assessed
Wingenfeld et al. (2015) ⁵⁸	San Francisco and Palo Alto, CA, USA	VA primary care	Urban	58 (SD 11)	Veteran	6.4% female	57.2% Cau	L	Cross-sectional	1,020 assessed

* Risk of bias calculated using adapted Hoy et al.'s Risk of Bias Tool.¹⁵ Authors adapted ranges out of 9; score 7-9 low, 3-6 medium, and 0-2 high risk of bias.

Abbreviations: L: low risk of bias; M: medium risk of bias; N: number of subjects; USA: United States of America; VA: Veterans Affairs

Table 2

PTSD prevalence in primary care populations

Study	N of completed PTSD assessment	PTSD ascertainment tool	Mean questionnaire scores (SD)	Cutoff scores	Time period of PTSD symptoms measured	PTSD Prevalence	
						Point	Lifetime
Stein et al. (2000) ¹⁷	368	PCL-C	29.7 (12.5)	4 or 5 on at least 1 "B" criteria, at least 2 "C" criteria, and at least 1 "D" criteria	Past month	9%	
Applegate (2001) ¹⁸	431	DIS-IV	N/A	N/A	Past month	10%	21.6%
Taubman-Ben-Ari et al. (2001) ¹⁹	2,975	PTSD Inventory from Solomon et al. 1987 ⁵⁹	Not reported	Not reported	Past month	23%	
Carey et al. (2003) ²⁰	220	Adapted CIDI	N/A	N/A	Past month	19.9% (16.7% male, 21.9% female)	44.3% (42.3% male; 45.5% female)
Thulesius et al. (2004) ²¹	1,113	PTSS-10 and IES and 7 additional items re: hyperarousal symptoms	Not reported	>35 for IES and >5 for PTSS-10	Past few days	6.5%	
Gillock et al. (2005) ²²	232	PCL-C plus additional items to assess DSM-IV criteria E and F "Life Events Checklist"	Not reported	If met criteria A through F	Past month	9% full PTSD/25% partial PTSD	
Gomez-Benevto et al. (2006) ²³	295	CIDI	N/A	N/A	Past month and lifetime	9%	14.5%
Kroenke et al. (2007) ²⁴	965	SCID	N/A	N/A	Past month	8.6%	
Liebschutz et al. (2007) ²⁵	509	CIDI	N/A	N/A	"[C]urrent past 12 mo and lifetime PTSD documented from CIDI"	23% (95% CI, 19-26%)	34%
Peltzer et al. (2007) ²⁶	250	PCL-C, interview administered; Trauma History Questionnaire	M 3.5 (SD not provided)	3+ ("cluster scoring")	Past month	12.4%	
Cwikel et al. (2008) ²⁷	976	"PTSD Checklist-21 items"	Not reported	Not reported	Not reported	2.9%	
Fedovskiy et al. (2008) ²⁸	105	Posttraumatic Stress Diagnostic Scale "structured interview"	Not reported	28 out of 49	Past month	19%	

Study	N of completed PTSD assessment	PTSD ascertainment tool	Mean questionnaire scores (SD)	Cutoff scores	Time period of PTSD symptoms measured	PTSD Prevalence	Point	Lifetime	Medical records/claims
Fogarty et al. (2008) ²⁹	367	Short screen from Breslau et al. ⁶⁰	Not reported	4+	Past month	14.6%			
Duran et al. (2009) ³⁰	234	CIDI	N/A	N/A	Past year	14.5%			
Freedly et al. (2010) ³¹	411	CAPS (modified for telephone interview rather than face-to-face)	N/A	N/A	Past month	32.1% (19.4% male; 34.8% female)			
Gaynes et al. (2010) ³²	647	MINI	Not reported	2	Past month	6.3%			
Wrenn et al. (2011) ³³	767	PSS	Not reported	“A categorical variable that serves as a proxy for PTSD was created based on DSM-IV A-E criterion responses to the PSS questionnaire (A, presence of trauma; B, presence of at least 1 intrusive symptoms; C, presence of at least 3 avoidance/numbing symptoms; and D, presence of at least 2 hyperarousal symptoms; and E, present for at least 1 month).”	Past month	30%			
Vera et al. (2012) ³⁴	3,568	PC-PTSD	Not reported	3+	Past month	14%			
Bunewicius et al. (2014) ³⁵	988	MINI	Not reported	Not reported	Past two weeks	2%			
Preville et al. (2014) ³⁶	1,765	PTSS Scale	7.5 (9.6)	10	6-months	11.1%			
Bener et al. (2015) ³⁷	1475	Arabic WMH-CIDI-10 (version 3.0)	N/A	N/A	Past month	10.5%			
Special Risk Populations (Refugee/Immigrant)									
Eisenman et al. (2003) ³⁸	512	PCL-C	Not reported	Not reported	Past month	12.5% (18% if exposed to violence, 8% if not exposed)			
Eytan et al. (2007) ³⁹	101	Adapted MINI	1st criteria 83%, 2nd	Not reported	Past month	23.8%			

Study	N of completed PTSD assessment	PTSD ascertainment tool	Mean questionnaire scores (SD)	Cutoff scores	Time period of PTSD symptoms measured	PTSD Prevalence	Point	Lifetime	Medical records/claims
Aragona et al. (2013) ⁴⁰	391	Harvard Trauma Questionnaire	Not reported	2.5	Past month	10.2%			
Veterans									
Dobie et al. (2002) ⁴¹	282	CAPS	N/A	N/A	Past month	36%			
Mori et al. (2003) ⁴²	309	BAI-PC	BAI-PC mean 4.27 range 0-21	BAI-PC cutoff 5 and above; PCL 50	“Current PTSD”	12%			
Prins et al. (2003) ⁴³	167	CAPS	N/A	N/A	Past month	24.5%			
Escalona et al. (2004) ⁴⁴	264 (134 veterans and 130 non-veteran controls)	CIDI	N/A	N/A	Lifetime	27%			
Magruder et al. (2005) ⁴⁵	746	CAPS	N/A	N/A	Past month	11.5%			
Spiro et al. (2006) ⁴⁶	2,262	PCL-M	PTSD+ M=56.1, SD=12.3, range 31-85 (does not list these measures for the group as a whole)	Not reported	Past month	20%			
Seal et al. (2007) ⁴⁷	103,788	Medical record review, ICD-9 code	N/A	N/A	Diagnosis present in the medical record	13%			
Funderburk et al. (2008) ⁴⁸	10,043	PC-PTSD	Not reported	3 means “at risk”	Past month	3.5%			
Kinder et al. (2008) ⁵⁰	35,715	ICD-9 or self-report	N/A	N/A	Lifetime	12.1%			
Andersen et al. (2010) ⁵¹	4,416	Medical record review, ICD-9 dx by primary care provider	N/A	N/A	Past month symptoms,	14.5%			

Study	N of completed PTSD assessment	PTSD ascertainment tool	Mean questionnaire scores (SD)	Cutoff scores	Time period of PTSD symptoms measured	PTSD Prevalence	Point Lifetime	Medical records/claims
Haskell et al. (2010) ⁵²	1,129	PC-PTSD	Not reported	3 means "at risk"	screen given yearly, diagnosed within 6 years of the study	31.1% (33% male; 21% female)		
McDevitt-Murphy et al. (2010) ⁵⁵	151	PCL-M	Not reported	50	Past month	39.1%		
Zivin et al. (2010) ⁵⁴	2,536,727	Medical record review, dx method not reported	N/A	N/A	Diagnosis present in the medical record	4.2%		
Mitchell et al. (2014) ⁵⁵	492	Medical record review, ICD-9 code	N/A	N/A	Diagnosis present in the medical record	26.8%		
Mohanty et al. (2015) ⁵⁶	78,435	Medical record review, ICD-9 code	N/A	N/A	Diagnosis present in the medical record	29.2%		
Trivedi et al. (2015) ⁵⁷	4,461,208	Medical record review, ICD-9 code	N/A	N/A	Diagnosis present in the medical record	9%		
Wingenfeld et al. (2015) ⁵⁸	613	CAPS	N/A	N/A	Past month and lifetime	48.8%		

Abbreviations: BAI-PC: Beck Anxiety Inventory-Primary Care; BPHQ: Brief Patient Health Questionnaire; CAPS: Clinician-Administered PTSD Scale; CIDI: Composite International Diagnostic Interview; DIS-IV: diagnostic interview schedule for DSM-IV; DSM-IV: Diagnostic and Statistical Manual, fourth edition; DX: diagnosis; ICD-9: International Classification of Diseases, Ninth Revision; IES: Impact of Event Scale; MINI: Mini-international Neuropsychological Interview; PC-PTSD: Primary Care PTSD Screen; PCL-C: PTSD checklist-civilian; PCL-M: PTSD checklist-military; PTSS: Post Traumatic Stress Syndrome; PCL: PTSD checklist; PTSD: Posttraumatic stress disorder; PTSS-10: Posttraumatic Stress Syndrome-10; SCID: Structured Clinical Interview; VA: Veterans Affairs; WMH: World Mental Health