

Prevalence and Treatment of Obsessive-Compulsive Disorder in Veterans and Active-Duty Service Members: A Systematic Review

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The prevalence and treatment of obsessive-compulsive disorder (OCD) in veterans and active-duty military remains unclear. We systematically reviewed literature on OCD diagnosis and treatment in U.S. Veterans and active-duty military to obtain a prevalence estimate, describe treatment approaches for OCD in veterans, and evaluate use of Exposure and Response Prevention (ERP). Eight terms were used to identify studies in PubMed, PsychINFO and SCOPUS up to March 13, 2018; additional articles were identified from reference lists of 19 included studies, 16 addressing prevalence, and 3 addressing treatment. OCD prevalence is lower in studies employing electronic medical records databases than in studies using OCD assessments, suggesting underrecognition of OCD in clinical settings. Higher prevalence was seen with OCD screening tools than with diagnostic interviews. Lower OCD prevalence was seen in active-duty individuals than in veterans. Two case studies showed a decrease in OCD symptoms following ERP. Additional studies with larger samples and controlled designs examining ERP are needed.

Keywords: obsessive-compulsive disorder; veterans; review; systematic; prevalence; military

Obsessive-compulsive disorder (OCD) is a mental health condition, characterized by unwanted intrusive thoughts and repetitive compulsive behaviors that tend to persist in the absence of appropriate treatment (Eisen et al., 2013; Visser, van Oppen, van Megen,

Eikelenboom, & van Blkom, 2014). OCD has significant impacts upon patients' employment, family, and functioning (Kessler, Chiu, Demler, & Walters, 2005) and is associated with a high disease burden (Huppert, Simpson, Nissenson, Liebowitz, & Foa, 2009; Macy et al., 2013; Markarian et al., 2010). A quarter of individuals with OCD attempt suicide at some point in their lives (Torres et al., 2007), and 1.5% die by suicide (Fernandez de la Cruz et al., 2017).

Epidemiologic surveys estimate the prevalence of OCD in the general U.S. population at 2.3% (Ruscio, Stein, Chiu, & Kessler, 2010). Although no such broad epidemiological study of OCD has been carried out specifically among active-duty military or veteran populations, rates of psychiatric disorders such as posttraumatic stress disorder (PTSD), major depressive disorder, generalized anxiety disorder, and panic disorder tend to be higher among soldiers and veterans than among community samples (Kessler et al., 2014; Seal, Bertenthal, Miner, Sen, & Marmar, 2007). OCD prevalence among active-duty military and veterans has been examined only in smaller populations/samples with a range of case-finding methodologies, and no systematic review of this literature has been conducted to date. The absence of routine OCD screenings via standardized protocols in the veterans Health Administration (VHA) and the Department of Defense (DoD) also contributes to the uncertainty regarding prevalence rates in these settings.

Similarly, the rate of evidence-based care for service members and veterans with OCD is unknown. The gold standard, evidence-based psychotherapy for OCD, Exposure and Response Prevention (ERP), is a specialized cognitive-behavioral intervention, typically conducted over the course of 16–20 90-minute therapy sessions (Foa, Yadin, & Lichner, 2012). Although ERP has solid empirical support in community samples, there is little knowledge about its effectiveness among veterans. Evaluation of the clinical effectiveness of ERP among veterans is important given research indicating veterans respond differently to psychological treatments than civilians do (e.g., Barrera et al., 2015; Mohr, Carmody, Erickson, Jin, & Leader, 2011). However, few veterans with OCD likely receive a full course of ERP (16–20 sessions), given VHA data showing that, in the year following OCD diagnosis, veterans received an average of 3.9 individual psychotherapy visits (Barrera et al., 2018), and that few VHA providers have sufficient training in ERP (Stanley et al., 2017). Although medications for OCD are also effective, several clinical trials demonstrate the superiority of ERP to antidepressant medications in reducing OCD symptoms (Foa et al., 2005; Nakatani et al., 2005).

Understanding the estimates of OCD prevalence and existing treatments among active-duty service members and veterans can help the DoD and VHA evaluate current assessment and treatment practices and plan future provider training efforts. The goal of this study was to systematically review the literature on OCD diagnosis and treatment in U.S. Veterans and active-duty service members to (a) obtain a broad prevalence estimate of OCD in these populations, (b) describe current published treatment approaches for OCD in veterans, and (c) evaluate the use of ERP in these studies.

METHODS

Literature Search Strategy

PubMed, PsychINFO and SCOPUS electronic databases were searched to identify articles published from the first allowable search date up to March 13, 2018, addressing prevalence and treatment of OCD among U.S. active-duty personnel and veterans. The following Medical Subject Headings (MeSh) search terms were used: *Obsessive Compulsive Disorder, OCD, OCD symptoms, veterans, United States Department of veterans Affairs, VHA, military personnel, and United States Department of Defense.*

Inclusion Criteria and Procedures

Articles were included if they met the following criteria: (a) original empirical research; (b) English as language of publication; and (c) content-addressed prevalence or treatment of OCD or significant OCD symptoms in active-duty military personnel or veterans in the U.S. Department of

Defense or VHA. The first author (EM) reviewed all unique titles and abstracts of studies identified via the search strategy for inclusion. Full articles that had the potential to meet inclusion criteria were identified and subsequently reviewed by EM and MAS to determine eligibility. A third investigator (NVK) then independently reviewed the articles to evaluate inclusion status, and additional studies were identified from the references of articles that met eligibility criteria.

RESULTS

Figure 1 shows the numbers of articles located by the search and reasons for exclusion. Interrater reliability was calculated for a subset of full-text articles ($n = 29$) and indicated good agreement on articles to be included in this review: 83% agreement, Cohen's Kappa (κ) = 0.66 (95% confidence interval [CI] = 0.39, 0.93); any disagreements were resolved following discussion between the raters and consensus rating. A total of 19 articles were included in this review (see Figure 1), 16 of which addressed prevalence, and 3 of which addressed treatment.

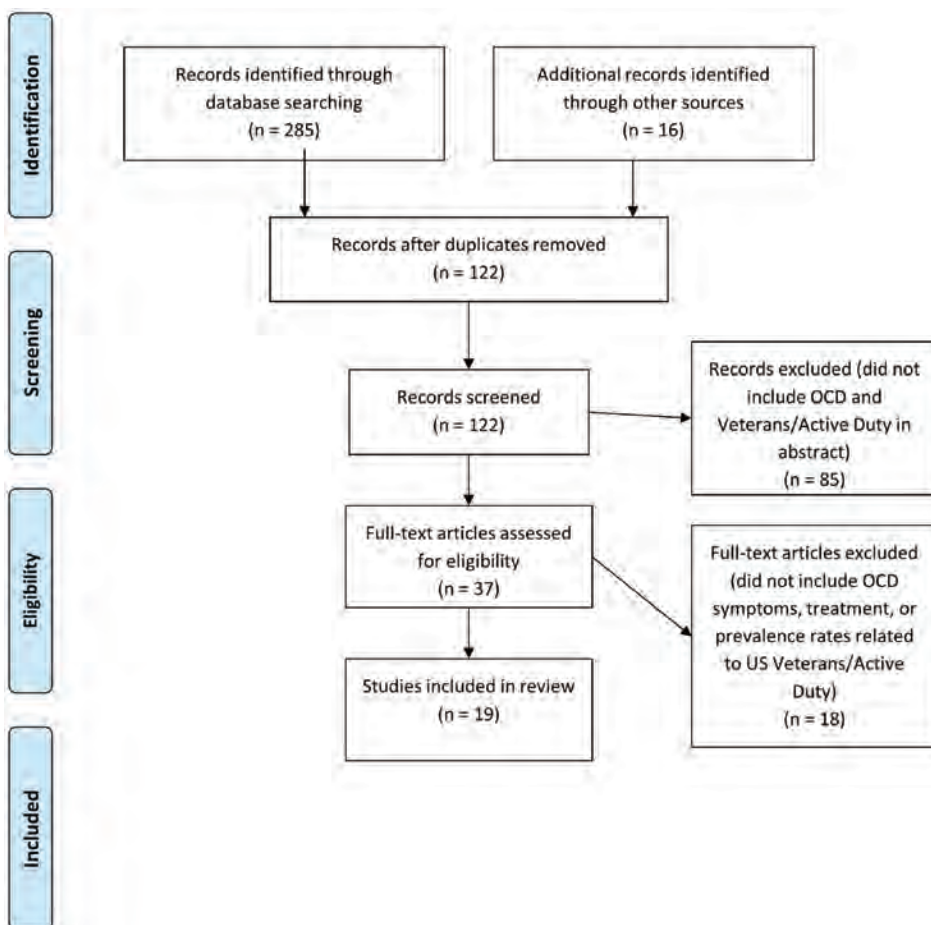


FIGURE 1. Articles located by the search and reasons for exclusion.

Prevalence Articles

A total of 16 articles included in this review addressed estimated OCD prevalence among active-duty military personnel or veterans. Initial review of articles revealed that prevalence was estimated using three different case-finding methodologies: (a) database reviews, (b) administration of structured diagnostic interviews, or (c) use of a CD screening instrument. For purposes of this review, studies are presented separately based on their methodology (Tables 1 and 2). Overall, database studies (studies where OCD prevalence was determined from a diagnosis noted in a database of electronic medical records) yielded lower estimates of OCD prevalence than studies that used structured interviews or screening assessments.

Estimated prevalence of OCD across the six studies using the database-review method ranged from 0.04% to 2.38% (see Table 1). Within these studies, prevalence was lower for active-duty military samples (0.04%–1.9%) than for veteran samples (0.22%–2.38%). Within the veteran population, rates were slightly lower in general samples (0.31%–0.80%) than in samples restricted to individuals with identified depression (1.0%–2.38%). One study found that the majority of OCD diagnoses were made by physicians (48.6%) and behavioral health providers (31.9%; Barrera et al., 2018).

The remaining 10 studies estimated prevalence of OCD within veteran populations with the use of a structured interview or screener questionnaire, with rates ranging from 0.8% to 28% (see Table 2). Rates of OCD varied widely within the studies/populations examined. One study, which focused specifically on Vietnam, World War II, and Korean War veterans who were exposed to severe combat stress, reported rates ranging from 0% to 6% (Mellman, Randolph, Brawman-Mintzer, Flores, & Milanese, 1992). Vietnam-era veterans' prevalence rates across studies ranged from 0.8% (Jordan et al., 1991) to 10.8% (Miller, Fogler, Wolf, Kaloupek, & Keane, 2008). One study of Iraq/Afghanistan veterans reported a lifetime prevalence rate of 2.1% (Kimbrel et al., 2014). Four studies that assessed broader groups of veterans reported prevalence rates ranging from 1.9% (Gros, Magruder, & Frueh, 2013) to 28% (Rutledge, Adler, & Friedman, 2011). Rates varied specific to populations surveyed: 1.9% of veterans in primary care (Gros et al., 2013); 3.3% of veterans with probable gambling disorder (Shirk et al., 2018); 18.2% of Puerto Rican male veterans (Galarza, Diaz-Ramirez, Guzman, Caballero, & Martinez, 1997); and 7%–28% of obese veterans (7% of nonsurgery candidates, 28% of surgery candidates; Rutledge et al., 2011).

Within this group of 10 assessment-focused studies, the specific methodology used to assess for OCD appeared to have an impact on prevalence estimates. The highest prevalence estimates of 18.2% (Galarza et al., 1997) and 28% (Rutledge et al., 2011) were reported when nonvalidated self-report screening instruments were used. It is important to note that these studies included only veterans with an identified mental or physical disorder (e.g., depression, obesity), which might impact the prevalence estimates. The lowest prevalence rates from these 10 studies were found with semistructured/structured clinical interviews, including the Diagnostic Interview Schedule (0.8%; Jordan et al., 1991), Mini International Neuropsychiatric Interview (1.9%; Gros et al., 2013), and versions of the Structured Clinical Interview for *Diagnostic & Statistical Manual Disorders*, which ranged from 1% (Orsillo et al., 1996) to 10.8% (Miller et al., 2008).

Treatment Articles

The three treatment articles identified were single-case studies (see Table 3). No randomized clinical trials were identified. One of the three case studies (Bourgeois & Bunn, 1996) described a 26-year-old man with an onset of OCD symptoms while in the Air Force. Symptoms included checking, mental rituals, contamination, hyper-responsibility, and confessing “bad” thoughts. Medication (fluoxetine), ERP, and cognitive therapy were used to treat his OCD, which resulted in a self-reported significant decrease in OCD symptoms. Although this study reported the use of evidence-based therapy for OCD (ERP and selective serotonin reuptake inhibitors [SSRIs]

TABLE 1. DATABASE STUDIES OF OCD FREQUENCY IN VETERANS OR ACTIVE-DUTY SERVICE MEMBERS

Reference	Sample	Criterion/Definition of OCD	Estimated OCD Prevalence
Barrera et al. (2017)	20,364 veterans newly diagnosed with OCD from 2010 to 2011	ICD-9 code identified through administrative review of VHA electronic medical records	20,634 (0.31%) Prevalence of newly diagnosed OCD cases in VHA
Barrera et al. (2014)	292,244 veterans newly diagnosed with an anxiety disorder in fiscal year 2010	ICD-9 code identified through administrative review of VHA electronic medical records	2,901 (1.0%) Prevalence of OCD among veterans newly diagnosed with anxiety disorder
Gunderson and Hourani (2001)	5,932 active-duty Navy service members hospitalized for neurotic disorder between 1980 and 1988	ICD-9 code identified through administrative review of U.S. Navy hospitalization records	115 (1.9%) Prevalence of OCD among Navy service members hospitalized for neurotic disorder
Lovering, Proctor, and Heaton (2013)	Active-duty service members (all branches) between 2000 and 2009	ICD-9 code identified through administrative review of ambulatory visits in Defense Medical Epidemiology Database	5,043 (0.04% among all service members) (1.9% in service members newly diagnosed with an anxiety disorder)
Pfeiffer, Ganoczy, Ilgen, Zivin, and Valenstein (2009)	887,859 veterans with depression diagnosis between April 1, 1999, and September 30, 2004	ICD-9 codes identified through administrative review of VHA NARDEP treatment and administrative records.	1.0% ($n = 8,869$)
Scherrer et al. (2010)	355,999 veterans free of cardiovascular disease in FY 1999 and 2000 with ($n = 96,612$) and without ($n = 259,387$) depression	ICD-9 code identified through administrative review of VHA electronic medical records	Among total cohort: 0.80% ($n = 2864$) Among those with depression: 2,303 (2.38%) Among those without depression: 561 (0.22%)

ICD-9 = International Classification of Diseases, 9th Edition; NARDEP = national database of veterans in depression treatment; OCD = obsessive-compulsive disorder; VHA = Veterans Health Administration.

TABLE 2. PREVALENCE STUDIES USING A STRUCTURED INTERVIEW OR SCREENER TO IDENTIFY OCD

Reference	Sample	Assessment and Criterion of OCD	Prevalence
Galarza et al. (1997)	Puerto Rican male veterans with alcohol dependence undergoing treatment (or recruited for treatment trial ($n = 11$))	OCD screener Cutoff of 10 on OCD screener	2 patients in study had OCD symptoms (18.2%)
Gros et al. (2013)	854 veterans in VHA primary care	MINI Diagnostic criteria per the MINI for OCD	16 (1.9%)
Jordan et al. (1991)	Veterans ($n = 3,016$); male and female Vietnam-theater veterans, Vietnam-era veterans and civilians	DIS structured interview Diagnosis per <i>DSM III</i> criteria	Lifetime OCD PR for Vietnam-theater men (1.8%), -era men (1.2%), -theater women (1.5%), -era women (0.8%); Current OCD PR for -theater men (1.5%), -era men (0%), -theater women (1.0%), -era women (0.8%)
Kimbrel et al. (2014)	Veterans ($n = 1,897$); Iraq/Afghanistan era	SCID-1 Diagnosis per <i>DSM-IV-TR</i>	Lifetime OCD PR of total sample ($n = 1,897$) was 2.1%.
Mellman et al. (1992)	Veterans exposed to severe combat stress ($n = 60$)	<i>DSM III-R</i> Diagnosis per <i>DSM III-R</i> criteria	Lifetime OCD PR of veterans exposed to severe combat stress was 3% ($n = 2$). Vietnam veterans in this sample were 4% ($n = 1$), World War II and Korean War veteran non-POWs were 6% ($n = 3$), and POWs were 0% ($n = 0$). 20% overall met subthreshold criteria (26% Vietnam, World War II and Korean non-POW 17%, POW 13%).
Miller et al. (2008)	Male Vietnam-theater veterans ($n = 1,325$); served from August 1964 to May 1975	SCID for <i>DSM-III-R</i> Diagnosis per SCID	OCD lifetime PR was 10.8%.
Orsillo et al. (1996)	Male Vietnam-theater veterans ($n = 311$).	SCID for <i>DSM-III-R</i> Diagnosis per SCID and Clinician-administered PTSD scale	Current PR for OCD w/ comorbid PTSD was 5% (8/173); current PR for OCD without PTSD was 1% (1/106). Lifetime PR for OCD with PTSD was 6% (10/174); lifetime PR for OCD without PTSD was 1% (1/106).

(Continued)

TABLE 2. PREVALENCE STUDIES USING A STRUCTURED INTERVIEW OR SCREENER TO IDENTIFY OCD (CONTINUED)

Reference	Sample	Assessment and Criterion of OCD	Prevalence
Roszell et al.(1991)	Male Vietnam combat veterans ($n = 116$), PTSD clinical team referral at Seattle VHA from 1987to 1989	SCID-P Diagnosis per <i>DSM-III-R</i>	4.2% ($n = 2$) had current dx of OCD w/ PTSD, and 4.2% ($n = 2$) had lifetime dx of OCD.
Rutledge et al., (2011)	Obese veterans ($n = 95$); eligible for bariatric surgery, in class from 2007 to 2008	MOVE! 23 (MOVE! Questionnaire) Self-rated OCD diagnosis per OCD on questionnaire checklist	OCD PR for nonsurgery patients ($n = 70$) was 7.0%; prevalence for surgery candidates ($n = 25$) was 28.0%. Bariatric candidates were more likely to endorse OCD (OR = 3.6, 95% CI = 1.5–6.4) and less likely to endorse depression during intake class (OR = 0.21, 95% CI = 0.05–0.85) than nonsurgery candidates.
Shirk et al. (2018)	Treatment-seeking veterans meeting criteria for gambling disorder ($N = 61$)	SCID-I/P Diagnosis per <i>DSM-IV</i>	Current PR was 3.3% ($n = 2$).

CI = confidence interval; DIS = Diagnostic Interview Schedule; *DSM III = Diagnostic and Statistical Manual, Third Edition*; MINI = Mini International Neuropsychiatric Interview; *DSM IV-TR = Diagnostic and Statistical Manual, Fourth Edition, Text Revision*; OCD = obsessive-compulsive disorder; OR = odds ratio; VHA = Veterans Health Administration; PR = prevalence rates; SCID = Structured Clinical Interview for *Diagnostic and Statistical Manual Disorders*; POWs = prisoners of war.

medication), no standardized measures were included to assess a clinically significant decrease in symptom severity. Another case report (Pitman, 1993) described a 46-year-old male Vietnam Army veteran with diagnoses of PTSD, OCD, major depression, dysthymia, and panic disorder. OCD and related symptoms included checking rituals, counting, handwashing, hoarding, and tics. Treatment for this veteran included a stay at an inpatient PTSD unit, group therapy, imaginal flooding, and medication. Although SSRIs were tried, ERP was not used, and benefits from the medication did not occur. The third case (Proescher, 2010) described a 24-year-old female U.S. Army Reservist. OCD symptoms were present before she joined the military, and there was a family history of OCD symptoms. This veteran's diagnoses included OCD, alcohol abuse, and depression disorder not otherwise specified, with body dysmorphic disorder suggested as a possible rule-out. OCD and related symptoms included contamination fears (with associated ritualistic handwashing), checking rituals, and body-image thoughts. Treatment included ERP; hypnosis was used in 11 of the 26 sessions, with the goal of enriching ERP treatment (this is not supported by research). Yale-Brown Obsessive Compulsive Scale (Goodman et al., 1989) scores decreased from a baseline of 24 (of a maximum severity score of 40) to 12 at posttreatment and 6 at 4-month follow-up. Refer to Table 3 for a detailed overview of the treatment articles presented in this review.

TABLE 3. CASE STUDIES: OCD TREATMENT IN VETERANS AND ACTIVE-DUTY MILITARY

Reference	Veteran Characteristics	Diagnosis	Treatment	Symptoms	Outcome Measures	Results
Bourgeois and Bunn (1996)	26 y/o male Air Force officer (active duty)	OCD	Medication (SSRI), ERP, and CT	Checking, mental rituals, contamination, hyper-responsibility, confessing "bad" thoughts	None	Active-duty member reported significant decrease in OCD symptoms
Pitman (1993)	46 y/o male Vietnam Army veteran	PTSD, OCD, major depression, dysthymia and panic disorder	Inpatient PTSD unit, group therapy, imaginal flooding and medication, including: clomipramine, fluoxetine, tricyclic antidepressants, monoamine oxidase inhibitors, neuroleptics, lithium, carbamazepine, clonidine, and clonazepam	Checking rituals, counting, hoarding, and tics	YBOCS at baseline only (37)	Veteran did not benefit from medications tried.
Proescher (2010)	24 y/o female U.S. Army reservist	OCD, Alcohol abuse, depression disorder NOS and rule out BDD.	Hypnosis and ERP	Contamination, checking rituals, body-image thoughts	YBOCS; Session 6: 24; end of treatment: 12, 4 months follow-up: 6	Decrease in OCD symptoms

BDD = body dysmorphic disorder; CT = cognitive therapy; *DSM III-R* = *Diagnostic and Statistical Manual, Third Edition, Revised*; *DSM IV* = *Diagnostic and Statistical Manual, Fourth Edition*; dx = diagnosis; ERP = Exposure and Response Prevention; NOS = not otherwise specified; OCD = obsessive-compulsive disorder; PR = prevalence rate; SCID-I/P; PTSD = posttraumatic stress disorder; SCID = Structured Clinical Interview for *Diagnostic and Statistical Manual Disorders*; SSRI = selective serotonin reuptake inhibitor; YBOCS = Yale-Brown Obsessive Compulsive Scale; y/o = years old.

DISCUSSION

Estimated OCD prevalence varies considerably across studies based on a number of methodological variables, including case-finding strategy and nature of the study sample. In particular, estimated OCD prevalence is lower in database studies than in studies specifically assessing OCD, indicating that a meaningful number of veterans with OCD may be falling through the cracks as their OCD has not directly been assessed/recognized; and care is, therefore, likely not being implemented. Higher prevalence was indicated when a screening tool was used to specifically assess for OCD than when a diagnostic interview was administered. Additionally, lower OCD prevalence rates were reported with the active-duty population than with the veteran population, possibly because the majority of veterans assessed were seeking VHA services. Increased stigma may exist for active-duty members, thus reducing reporting of these symptoms. These findings are consistent with other studies reporting higher rates of psychiatric disorders in veterans (Eisen et al., 2004; Seal et al., 2007) than in active-duty service members (Kessler et al., 2014; Riddle et al., 2007). Unsurprisingly, higher potential rates of OCD were reported when the study sample had another existing psychological or medical condition (e.g., depression, diabetes).

Variability in prevalence due to heterogeneous assessment and sampling methodologies is consistent with other reviews of anxiety prevalence (e.g., Remes, Brayne, van der Linde, & Lafortune, 2016). This variation, along with the assumed high rates of underdiagnosis of active-duty veterans with OCD, builds the case for including standardized reliable/valid screeners for OCD with follow-up care via clinical evaluation and treatment.

The two treatment studies in which veterans received ERP reported a decrease in OCD symptomology. A decrease in OCD symptoms did not occur when treatment involved a stay on a PTSD unit where group therapy, imaginal flooding, and medication (SSRI) were used. As such, available outcomes are promising for the use of ERP for OCD within the veteran population. However, there have been no controlled trials; and possible differences in ERP effectiveness may exist across veteran and non-Veteran populations, as has been the case for the treatment of depression (Mohr et al., 2011) and late-life anxiety (Barrera et al., 2015). There clearly is a need for more studies with larger samples and controlled designs to test the effectiveness of ERP for OCD within the veteran population.

The VHA mandates standardized treatment protocols for anxiety disorders and mental health conditions with standardized evidence-based interventions. Despite this mandate and the effectiveness that supports ERP as an effective evidence-based intervention for OCD, no standardized treatment protocol exists. This omission directly impacts VHA practitioners' ability to offer adequate assessment and treatment of OCD and significantly impacts direct patient care, widening the gap between veterans with OCD who are both diagnosed and appropriately treated. Standardized screening/assessment protocols and treatment protocols for OCD are warranted within the VHA.

Limitations/Future Directions

The limited number of studies addressing the prevalence and treatment of OCD in the active-duty military and veteran communities significantly restricts conclusions that can be drawn from this review. Larger population-based studies are needed, as are large, randomized clinical trials. It was often hard to distinguish between OCD symptoms and diagnosis and the labeling/cutoff of a diagnosis for OCD and/or how an OCD diagnosis was truly assessed (no standardized measure used across studies). The variation in prevalence rates may be due to sample versus population estimates reported in the studies. Most of the studies were both limited and dated; and, of course, the possibility of database issues, including data collection and validity of data, exists. Future studies should address this via controlled research studies with standardized assessment and treatment protocols consistent with existing literature on evidence-based interventions for OCD.

CONCLUSION

Findings from this review further confirmed the need for standardized and validated OCD assessment methods and evidence-based treatments within the DoD and VHA. Lack of proper assessment, diagnosis, and treatment of OCD leads to increased symptomology, costs on the U.S. economy, and decreased functioning. A national standard for identifying OCD in these populations is indicated and evident through the large gap in OCD prevalence rates (0.04%–28%) reported in this review. Training protocols and consultation programs for DoD and VHA providers focused on OCD assessment, diagnosis, and treatment is warranted in order to provide needed services to active-duty service members and veterans. Future research should confirm OCD prevalence rates in active-duty service members and veterans though population-based studies and randomized clinical trials should confirm the effectiveness of ERP for OCD within this population.

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