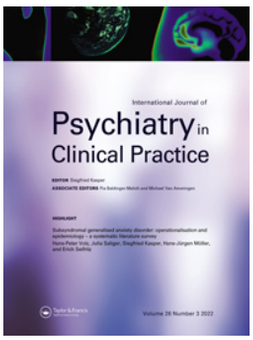

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Suicidality in patients with post-traumatic stress disorder and its association with receipt of specific secondary mental healthcare treatments

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ABSTRACT

Background: Post-traumatic stress disorder (PTSD) is a risk factor for suicidality (suicidal ideation, and suicide attempt). This study described the prevalence of suicidality amongst a representative sample of individuals with PTSD and the association between suicidality and receipt of five PTSD treatments.

Methods: We analysed deidentified data for patients being treated for PTSD at Camden and Islington NHS Foundation Trust between 2009 and 2017 obtained via the Clinical Record Interactive Search tool. We described the sample's sociodemographic and clinical characteristics and used stepwise logistic regression to investigate the association between suicidality and receipt of four, specific PTSD treatments: psychotherapy, antidepressant/antianxiety medication, antipsychotics, benzodiazepines. We used Cox proportional hazards regression to investigate the association between suicidality and hospital/crisis team admission.

Results: Of 745 patients diagnosed with PTSD, 60% received psychotherapy and 66% received psychotropic medication. Those who reported suicidality (6%) were no more likely than those who did not to be prescribed antidepressant/antianxiety medication, but were more likely to receive antipsychotics (AOR = 2.27, 95% CI 1.15 – 4.47), benzodiazepines (AOR 2.28, 95% CI 1.17 – 4.44), psychotherapy (AOR 2.60, 95% CI 1.18 – 5.73) and to be admitted to hospital/crisis team (AOR 2.84, 95% 1.82 – 4.45).

Conclusion: In this sample, patients with PTSD and suicidality were more likely to receive psychiatric medication, psychotherapy and psychiatric admission than those who were not suicidal. Overall patients were more likely to receive psychotropic medication than psychotherapy. Adherence to clinical guidelines is important in this population to improve treatment outcomes and reduce the risk of suicide.

KEY POINTS

- NICE guidelines recommend psychological therapy be first line treatment for PTSD, yet we identified that fewer people diagnosed with PTSD received therapy compared to psychotropic medication.
- Patients with suicidality were more likely to receive antipsychotics and benzodiazepines, yet not antidepressant/antianxiety medication although given that suicidality is characteristic of severe depression, it might be assumed from stepped care models that antidepressant/antianxiety medication be prescribed before antipsychotics.
- The high proportion of patients prescribed antipsychotics suggests a need for better understanding of psychosis symptoms among trauma-exposed populations.
- Identifying which combinations of symptoms are associated with suicidal thoughts could help tailor trauma-informed approaches to discussing therapy and medication.

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Introduction

Post-traumatic stress disorder (PTSD) is a debilitating psychiatric illness. Symptom burden causes levels of impairment comparable to other serious mental disorders (Kessler, 2000) and carries a risk of suicide attempt, suicide (Fox et al., 2021; Gradus et al., 2010, 2015) and suicidality (Galatzer-Levy et al., 2013; Hawgood & De Leo, 2008; Krysinska & Lester, 2010; Panagioti et al., 2009), defined as suicidal ideation and suicide attempts (Meyer et al., 2010). Indeed, in a meta-analysis of prospective studies quantifying the association between specific anxiety disorders and suicidality, PTSD was that with the strongest association (Bentley et al., 2016).

Early treatment can reduce distress, interrupt chronicity and progression and reduce the burden on healthcare services. Currently, evidence-based treatment guidelines recommend psychological interventions, such as individual trauma-focussed cognitive behavioural therapy (CBT) or eye movement desensitisation and reprocessing (EMDR), and antidepressants/antianxiety medication, such as selective serotonin reuptake inhibitors (SSRIs). Guidelines note that medication should not be used in preference to psychotherapy and that antipsychotic medication be reserved for disabling symptoms or for those who have not responded to the first-line treatments (NICE, 2018). Although the suicide preventive effects of psychiatric admission are unclear (Large & Kapur, 2018), patients with PTSD who present with suicidality or

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attempt suicide may be admitted to hospital or crisis teams (Hawton et al., 2007; Large & Kapur, 2018). Evidence to support the use of anti-anxiety and anti-depressant medication in reducing risk of repeat self-harm is weak (Hawton et al., 2016b) and the moderately strong evidence to support psychosocial interventions, such as CBT, (Hawton et al., 2016b) relates to the wider population of patients who self-harm, not specifically to those with PTSD.

As suicidality is a major predictor of suicide (Owens et al., 2002), it is important to understand the characteristics of people with PTSD who become suicidal and their treatment pathways. In this study, using routine clinical data, we aimed to describe the sociodemographic and clinical characteristics of patients in secondary mental healthcare diagnosed with PTSD and investigate the association between suicidality and five specific treatments for PTSD: psychological therapy, antidepressant/antianxiety medication (to reflect the prescription of medication for mood and anxiety disorders) (Zohar et al., 2014), antipsychotics, benzodiazepines and admission to hospital or admission to in-patient hospital units or to Crisis Resolution and Home Treatment Teams (CRHTT).

Methods

Setting and data collection

We analysed deidentified clinical data regarding patients who received secondary mental health services from Camden and Islington (C&I) NHS Foundation Trust; a large mental healthcare provider that offers comprehensive services to Camden and Islington, two inner-city London boroughs of approximately 440,000 residents (Werbeloff et al., 2018). The C&I catchment area has a slightly higher proportion of younger people (under the age of 35 years) than both London and England, a slightly higher proportion of white people than London but, a lower proportion of white people than England (Werbeloff et al., 2018). We obtained data via the Clinical Record Interactive Search (CRIS) tool, which extracts routinely collected electronic health records (EHR) from secondary care services (Werbeloff et al., 2018). It provides access to anonymised patient data for research purposes (Fernandes et al., 2013) using a precise deidentification process (Perera et al., 2016).

In 2018, the C&I research database, CRIS, contained detailed and anonymous information on more than 110,000 patients of whom 22% were receiving active care (Werbeloff et al., 2018).

Ethics

The NRES Committee East of England – Cambridge Central (14/EE/0177; extended in 2019: 19/EE/0210)—granted ethical approval to C&I CRIS. The C&I Research Database Oversight Committee at St Pancras Hospital, London, approved this study, and the C&I research database was accessed at this location. The CRIS security model holds that only approved researchers can access the data, which is analysed within the NHS firewall system thus adhering to NHS Information Governance rules.

Participants

Using the C&I Research Database, we identified a sample of 745 individuals meeting the following criteria:

- Patients who had accessed secondary mental health services at C&I NHS FT between 2009 and 2017
- Patients who were coded as having received a primary diagnosis of PTSD using the ICD-10 code F43.1 (WHO, 1992) regardless of secondary diagnoses.

Key covariates

Exposure variables

Suicidality was defined as suicidal ideation, behaviours and attempts (Meyer et al., 2010). We identified all patients with PTSD and recorded suicidality within the 6 months prior to, or 6 months after, a diagnosis of PTSD. Suicidality was measured using the Non-accidental self-injury scale (scale 2) on the Health of the Nation Outcome Scales (HoNOS) (Gowers et al., 1998). The HoNOS is a validated instrument (Pirkis et al., 2005) administered by clinicians to assess health and social functioning in individuals with mental health difficulties. The instrument includes 12 Likert-style scales rated from 0 (no problem) to 4 (severe problem) (Wing et al., 1998). The non-accidental self-injury scale in the HoNOS instrument reflects clinician judgement on a patient's degree of suicidal ideation and behaviour (see Box 1).

Using clinical judgement, we derived a binary exposure variable; patients scoring three and above were defined as exhibiting suicidality, whilst patients scoring two and below were defined as not. Given that the dataset contained repeat measures of HoNOS scores (representing successive clinical encounters), we selected the measure completed closest to the time of PTSD diagnosis for our analysis.

Suicide was not included as an outcome as we did not have access to data on cause of death and it would not have held statistical power for accurate analysis. We did not exclude patients who died during the period of observation.

Outcome variables

We identified five outcomes based on the treatments recommended for PTSD in NICE guidelines (National Collaborating Centre for Mental Health, 2005) and the literature describing the clinical effectiveness of treatments for suicidality (Hawton et al., 2016a, 2016b; Large & Kapur, 2018), capturing pharmacological treatments, psychological treatments and CRHTT.

Three of the five outcomes reflected the pharmacological treatments prescribed for patients diagnosed with PTSD including

Box 1. Non-accidental self-injury scale (scale 2) on the Health of the Nation Outcome Scales (HoNOS)

0 = No problem of this kind during the period rated.
1 = Fleeting thoughts about ending it all but little risk during the period rated; no self-harm.
2 = Mild risk during the period rated; includes non-hazardous self-harm (e.g., wrist-scratching).
3 = Moderate to serious risk of deliberate self-harm during the period rated; includes preparatory acts (e.g., collecting tablets).
4 = Serious suicidal attempt and/or serious deliberate self-injury during the period rated.
Note that this scale does not include accidental self-injury (due e.g., to dementia or severe learning disability), and instead the cognitive problem is rated at Scale 4 and the injury at Scale 5. It also does not include illness or injury as a direct consequence of drug/alcohol use (e.g., cirrhosis of the liver or injury resulting from drink driving), which are rated in Scale 5).

antidepressant/antianxiety medication, antipsychotics and benzodiazepines. To obtain the data as documented by the treating clinician we systematically searched all clinical notes for the terms antidepressant/antianxiety medication, antipsychotics and benzodiazepines using a simple text search, checking the text to consider the linguistic context of a word or phrase surrounding the target information before extraction, ensuring accurate data collection (Perera et al., 2016). For example, where a patient may have 'refused benzodiazepines', the data would not be extracted. Following data collection we created three binary variables to describe documented prescribing of each medication. We were unable to establish an accurate date for commencing each medication as the date recorded would correspond to a clinical note rather than initiation of medication.

The fourth treatment option reflected receipt of psychological treatment. For this we also used a simple electronic text search, searching all clinical notes for any of the following key words: psychology, therapy, psychological therapy, cognitive behavioural therapy, CBT, interpersonal therapy, IPT, dialectal behaviour therapy, DBT, mentalisation-based therapy, MBT. We created one binary variable for receipt of psychological treatment. As for medication, we were unable to establish a valid date for commencing each psychological treatment. A threshold for having received therapy was set at recorded attendances for at least three meetings with a psychologist or an equivalent practitioner delivering psychological therapy.

The fifth outcome was defined as admission to a psychiatric inpatient unit or to a CRHTT. Data on admissions were extracted from the structured fields within the C&I research database. We created one binary variable denoting admission to either location, setting the threshold at admission for at least one full day to denote adequate assessment. For this outcome we conducted a time to event analysis, as we could establish a valid recording of the date of admission and calculate exact follow-up. This allowed us to consider the differing periods of follow-up for each patient, reflecting differing periods in which to accumulate risk of admission.

Potential confounders

We selected the following socio-demographic and clinical variables *a priori* based on the literature and on clinical judgement identifying them as potential confounders of the association between suicidality and receipt of specific treatments in patients diagnosed with PTSD. These included: the length of time patients were known to the mental health Trust, year of suicidality assessment, gender (Klonsky et al., 2016; Klonsky & Muehlenkamp, 2007), age at PTSD diagnosis (Hawton et al., 2007; Katz et al., 2008; Nock et al., 2008; Zilcha-Mano et al., 2016), ethnicity (Curtin et al., 2016; Nock et al., 2008; Wierzbicki & Pekarik, 1993), marital status (Batty et al., 2018; Chin et al., 2017), area-level social deprivation (Batty et al., 2018; Curtis et al., 2006), drug and alcohol use (Driessen et al., 2008; Edwards et al., 2020; Poorolajal et al., 2016), depressed mood (Angst et al., 2002; Rytwinski et al., 2013) and relationship difficulties (Batty et al., 2018; Chin et al., 2017). We extracted data on these variables from the relevant structured fields within the C&I research database, or from HoNOS scales.

Time patients were known to the mental health trust was operationalised by calculating, in years, the period between 2009 to the date of PTSD diagnosis.

Age at diagnosis was based on years between date of birth and the date of PTSD diagnosis, grouped into 10-year age ranges from $\leq$24 to $\geq$65 years.

Ethnicity was grouped into six categories as operationalised previously (Werbeloff et al., 2018): 'White', 'Asian/Asian British', 'Black, Black British', 'Mixed', 'Other' and 'Missing' by collapsing the 18 higher order categories originally recorded in patients' notes.

Marital status was grouped into five categories as operationalised previously (Werbeloff et al., 2018): 'Single', 'Divorced/Separated', 'Widowed', 'Married/Civil Partner' and 'Missing' by collapsing the eight higher order categories originally recorded in patients' notes.

Index of Multiple Deprivation (IMD) measure score was calculated for each patient, as quintile values. The IMD pools information from 38 separate factors into seven spheres of deprivation (income; employment; health and disability; education, skills and training; barriers to housing and services; living environment and crime) to develop an individual score of deprivation for each of the 32,482 Lower Super Output Areas in England (LSOAs) (Werbeloff et al., 2016). Lower IMD scores represent lower levels of deprivation, and all scores were derived by linking the LSOA code with patients' postcodes (as recorded in the structured fields of the C&I research database), creating quintiles based on the sample itself.

Drug and alcohol use, depressed mood, relationship difficulties are three clinical variables derived from the following scales on any HoNOS measures recorded in the six months prior to or six months after a PTSD diagnosis: problem drinking or drug-taking (scale 3); problems with depressed mood (scale 7); and problems with relationships (scale 9). Based on clinical judgment a score of three or above on each scale was defined as a positive score generating a set of three binary variables.

Statistical analysis

We conducted all analyses using STATA version15 (StataCorp. College Station, TX). Chi-squared tests were conducted to report descriptive statistics on the sociodemographic and clinical characteristics of the sample, only including cases for whom we had complete data on model covariates. We ran logistic regression models for our four binary psychotropic and psychological therapy outcomes, estimating odds ratios (OR) and 95% confidence intervals (CI), with the threshold for significance set at a p value of 0.05 to examine the association between suicidality around the time of a PTSD diagnosis and receipt of medication and/or psychological therapy. We ran a Cox proportional hazards regression model for our admission outcome, to investigate the association between suicidality and admission to hospital or CRHTT, estimating hazard ratios (HR) and 95% confidence intervals, with the threshold for significance set at a p value of 0.05.

We adjusted all multivariable models stepwise as block adjustments for (1) time known to the Trust and year in which patients were assessed for suicidality, (2) block 1 plus age, ethnicity, marital status, and IMD, and finally (3) block 1 and 2 plus the three clinical variables derived from the HoNOS measure (drug and alcohol use, depressed mood and relationship difficulties).

Cases with missing data on any of the sociodemographic variables were excluded from the main analyses ($n = 131$). Cases where data was missing on any one of the three clinical variables derived from the HoNOS measure (drug and alcohol use, depressed mood and relationship difficulties) were labelled as missing and not included in the final analyses ($n = 6$).

Results

We analysed data for an eligible sample of 745 patients who had a primary diagnosis of PTSD in the C&I research database. Their sociodemographic and clinical characteristics are summarised in Table 1. Within the sample there was a slight predominance of

Table 1. Socio-demographic and clinical characteristics of sample ($n = 745$).

	Total sample *n* (%)	Suicidality reported *n* (%)	Suicidality not reported *n* (%)	*p* Value
	745	48 (6.44)	697 (93.56)	
Age groups (years)				
< =24	57 (7.65)	13 (22.81)	44 (77.19)	**<0.001**
25 – 34	169 (22.68)	12 (7.10)	157 (92.90)	
35 – 44	207 (27.79)	10 (4.83)	197 (95.17)	
45 – 54	193 (25.91)	10 (5.18)	183 (94.82)	
55 – 64	97 (13.02)	3 (3.09)	94 (96.91)	
> =65	22 (2.95)	0 (0)	22 (100)	
Missing	0 (0)			
Gender				
female	414 (55.75)	30 (7.25)	384 (92.75)	0.318
male	331 (44.43)	18 (5.44)	313 (94.56)	
Missing	0 (0)			
Ethnicity				
White/White British	352 (47.25)	22 (6.25)	330 (93.75)	0.405
Asian/Asian British	44 (5.91)	2 (4.55)	42 (95.45)	
Black/Black British	124 (16.64)	6 (4.84)	118 (95.16)	
Mixed	18 (2.42)	3 (16.67)	15 (83.33)	
Other	158 (21.21)	10 (6.33)	148 (93.67)	
Missing	49 (6.58)			
Marital status				
Single	379 (50.87)	30 (7.92)	349 (92.08)	0.267
Divorced/separated	119 (15.97)	6 (5.04)	113 (94.96)	
Widowed	18 (2.42)	0 (0)	18 (100)	
Married/cohabiting	147 (19.73)	10 (6.80)	137 (93.20)	
Missing	82 (11.01)			
Deprivation index				
Highest	160 (21.48)	6 (3.75)	154 (96.25)	0.216
Second	157 (21.07)	11 (7.01)	146 (92.99)	
Their	147 (19.73)	15 (10.20)	132 (89.80)	
Fourth	150 (20.13)	8 (5.33)	142 (94.67)	
Lowest	131 (17.58)	8 (6.12)	123 (93.89)	
Missing	0 (0)			
HoNOS sub-scales				
Drug and alcohol misuse (HoNOS sub-scale 3)†				
No	637 (85.50)	27 (4.24)	610 (95.76)	**<0.001**
Yes	106 (14.23)	21 (19.81)	85 (80.19)	
Missing	2 (0.27)			
Depressed mood (HoNOS sub-scale 7)†				
No	75 (10.07)	3 (4)	72 (96)	0.362
Yes	669 (89.80)	45 (6.73)	624 (93.27)	
Missing	1 (0.13)			
Relationship difficulties (HoNOS sub-scale 9)†				
No	306 (41.07)	18 (5.88)	288 (94.12)	0.586
Yes	436 (58.52)	30 (6.88)	406 (93.13)	
Missing	3 (0.40)			

†Using a threshold score of 3 or above on each HoNOS sub-scale to define a positive score

women (56%) and patients who were single (51%). The age group in which the highest proportion of PTSD was diagnosed was 34–44 years (28%) and the ethnicity with greatest proportion was White/White British (47%). Most individuals did not report drug or alcohol misuse (86%), however, just over half reported relationship difficulties (59%) and the majority experienced depressed mood (90%). Overall, 6% ($n = 48$) of individuals with PTSD reported suicidality within 6 months before or 6 months after the diagnosis. There were few demographic differences between those who reported or did not report suicidality. Two variables, younger age and drug and alcohol misuse, were associated with a higher probability of reporting suicidality.

Patients included in the analysis were known to the Trust for up to 7 years. The majority were known for less than 1 year (15%) but, there was no association between time known to the trust and reported suicidality.

Over half of all patients with PTSD had received psychological therapy (60%) and had been prescribed at least one psychotropic medication (66%) (Table 2). The medication most prescribed was antidepressant/antianxiety medication (61%) followed by benzodiazepines (35%) and antipsychotics (33%). In total, 25% a quarter of patients had been admitted to a psychiatric hospital or CRHTT. Amongst the individuals with suicidality, 79% three quarters received psychological therapy, over half (69%) obtained antidepressant/antianxiety medication, half (50%) obtained antipsychotic medication and 58% over half obtained benzodiazepines, whilst 65% were admitted to a psychiatric inpatient unit or CRHTT.

Associations between suicidality and specific PTSD treatment options

As shown in Table 3, in the context of PTSD, individuals with suicidality were no more likely than those without suicidality to be prescribed any one psychotropic medication. Similarly,

Table 2. PTSD treatments by reported suicidality.

	Total sample *n* (%) *n* = 745	Suicidality reported *n* (%) *n* = 48 (6.44%)	Suicidality not reported *n* (%) *n* = 697 (93.56%)	*p* Value
Antidepressant/antianxiety medication prescribed				
No	292 (39.19)	15 (31.25)	277 (39.74)	
Yes	453 (60.81)	33 (68.75)	420 (60.26)	0.244
Antipsychotic medication prescribed				
No	499 (66.98)	24 (50)	475 (68.15)	
Yes	246 (33.02)	24 (50)	222 (31.85)	**0.010**
Benzodiazepine medication prescribed				
No	486 (65.23)	20 (41.67)	466 (66.86)	
Yes	259 (34.77)	28 (58.33)	231 (33.14)	**<0.001**
Any one of the above medications prescribed				
No	251 (33.69)	8 (16.67)	243 (34.86)	
Yes	494 (66.31)	40 (83.33)	454 (65.14)	**0.010**
Receipt of psychological therapy*				
No	296 (39.73)	10 (20.83)	286 (41.03)	
Yes	449 (60.27)	38 (79.17)	411 (58.97)	**0.006**
Admission to psychiatric inpatient unit or CRHTT**				
No	556 (74.63)	17 (35.42)	539 (77.33)	
Yes	189 (25.37)	31 (64.58)	158 (22.67)	**<0.001**

*Defined as having attended ≥3 sessions with a psychological practitioner.
**Defined as having been admitted on ≥1 occasion to a Crisis Resolution and Home Treatment Teams (CRHTT) for at least one full day.

Table 3. Associations between reported suicidality and PTSD treatments.

Treatments	Prevalence of suicidal ideation or suicide attempt N (%)	Model 1 OR* (95% CI)	*p* Value	Model 2 OR** (95% CI)	*p* Value	Model 3 OR*** (95% CI)	*p* Value	Model 4 OR**** (95% CI)	*p* Value
Antidepressants/antianxiety	453 (61)	1.45 (0.77 – 2.72)	0.246	1.36 (0.72 – 2.57)	0.348	1.27 (0.65 – 2.50)	0.483	1.27 (0.64 – 2.55)	0.494
Antipsychotics	246 (33)	2.14 (1.89 – 3.85)	**0.011**	2.09 (1.14 – 3.85)	**0.017**	2.01 (1.06 – 3.84)	**0.034**	2.27 (1.15 – 4.47)	**0.018**
Benzodiazepines	259 (35)	2.82 (1.56 – 5.12)	**0.001**	2.80 (1.52 – 5.15)	**0.001**	2.45 (1.29 – 4.67)	**0.006**	2.28 (1.17 – 4.44)	**0.015**
Any one medication	494 (66)	2.68 (1.23 – 5.81)	**0.013**	2.54 (1.16 – 5.57)	**0.020**	2.25 (0.99 – 5.11)	**0.052**	2.10 (0.91 – 4.85)	0.083
Psychological therapy	449 (60)	2.64 (1.30 – 5.39)	**0.007**	2.72 (1.30 – 5.69)	**0.008**	2.69 (1.24 – 5.85)	**0.012**	2.60 (1.18 – 5.73)	**0.018**
	Events* (years 100 s)	**Model 1 HR*** (95% CI)	***p* Value**	**Model 2 HR**** (95% CI)	***p* Value**	**Model 3 HR***** (95% CI)	***p* Value**	**Model 4 HR****** (95% CI)	***p* Value**
Admitted to hospital or CRHTT	31 (50.50)	4.26 (2.89 – 6.28)	**<0.001**	4.21 (2.84 – 6.24)	**<0.001**	3.08 (2.03 – 4.66)	**<0.001**	2.84 (1.82 – 4.45)	**<0.001**

OR: odds ratio (from logistic regressions); HR: hazard ratio (from Cox regression).
*Model 1: Unadjusted.
**Model 2: Adjusted for time known to the Trust and year of assessment for suicidality.
***Model 3: Adjusted for time known to the Trust, year of assessment for suicidality, and socio-demographic factors.
****Model 4: Adjusted for time known to the Trust, year of assessment for suicidality, socio-demographic factors, and three HoNOS sub-scales.

they were no more likely to be prescribed antidepressants/antianxiety medication. Conversely, individuals with suicidality were 2.27 times as likely to be prescribed antipsychotics (AOR = 2.27, 95% CI 1.15 – 4.47), 2.28 times as likely to be prescribed benzodiazepines (AOR 2.28, 95% CI 1.17 – 4.44), and 2.60 times as likely to be referred for psychological therapy (AOR 2.60, 95% CI 1.18 – 5.73) than those with PTSD who did not have suicidality.

In relation to risk of psychiatric admission, patients with suicidality in the context of PTSD were 2.84 times as likely to be admitted to a CRHTT or to hospital (AOR 2.84, 95% 1.82 – 4.45) than those with PTSD who did not have suicidality.

Discussion

Main findings

We found, in a clinical sample of secondary care patients diagnosed with PTSD, a relatively low proportion of patients (6%) who reported suicidality within the 6 months before or 6 months after a PTSD diagnosis. Despite NICE recommendations regarding psychological therapy being first in line treatment for PTSD (NICE, 2018), only 60% of our overall sample received psychological therapy. We acknowledge that a higher proportion than this may have been offered therapy and refused or attended less than three sessions, as per our treatment definitions. Moreover, people could have received therapy in non-NHS services. Two thirds of patients had been prescribed at least one psychotropic medication, although we did not have data on the number of patients who had been offered medication and had turned this option down. We noted that over a quarter of this sample were prescribed antipsychotics and this high proportion may reflect the higher severity of PTSD in secondary care contexts. We also noted a high proportion (again over a quarter) of patients who were prescribed benzodiazepines; a class of drugs not recommended in PTSD NICE guidelines. A quarter of our sample were admitted to a psychiatric unit or CRHTT, highlighting the high symptom and healthcare cost burden of a PTSD diagnosis.

Treatments received by patients with PTSD who reported suicidality differed from those without in relation to prescription of antipsychotics and benzodiazepines, receipt of psychological therapy and psychiatric admission. Patients reporting suicidality were over twice as likely to have been prescribed antipsychotics and benzodiazepines, over two and a half times more likely to receive psychological therapy and almost three times as likely to have been admitted to a psychiatric hospital or CRHTT. It was notable

that there were no differences in prescribing of antidepressant/antianxiety medication by suicidality. As suicidal thoughts and acts are characteristic of people diagnosed with a severe depressive episode, whether with or without psychotic symptoms, it might be assumed from stepped care models that such patients would be prescribed antidepressant/antianxiety medication before recourse to antipsychotics.

Findings in the context of other studies

The prevalence of suicidality in psychiatric patients with PTSD in our sample (6%) was much lower than that estimated for psychiatric patients with comorbid PTSD and major depressive disorder (MDD) sampled in ten European countries (75%) (Dold et al., 2017). Both samples comprised inpatients and outpatients in academic psychiatric treatment centres, but the higher prevalence of suicidality estimated is likely to reflect the severity of MDD in the European sample (relating in part to the requirement for participants to be on at least one antidepressant medication), as well as the detailed clinical interview used to ascertain outcomes. It is possible that our approach to capturing suicidality, using HoNOS data, under-ascertained suicidality in our sample. The same European study found that 40% of patients with MDD and PTSD were on antidepressant medication augmented with at least one antipsychotic medication and 34% were on antidepressant medication augmented with at least one benzodiazepine/benzodiazepine-like medication (Dold et al., 2017). This is in comparison to the 33% of all patients in our study prescribed antipsychotic medication and the 35% prescribed benzodiazepine medication. Again, the slightly higher prevalence of being prescribed such medications is likely to reflect clinical severity in that sample. Of note, in patients with MDD in the European sample there was an association between comorbid PTSD and treatment augmentation with low-potency antipsychotics but, no association with first-line antidepressant prescribed or treatment response (to any medication) (Dold et al., 2017).

Our UK-based study describes a clinical sample in which there was no excess of women diagnosed with PTSD. This is despite Danish research describing a female two-fold excess risk of PTSD, for which it is hypothesised that women are more prone to traumatic experiences than men and may have an increased vulnerability to PTSD (Christiansen & Hansen, 2015). Our study included only patients in secondary care, and our findings suggest that some men with PTSD may not be accessing services, or that women with PTSD may be more likely to be treated in primary rather than secondary care. The peak age group for PTSD diagnosis in our sample was 34–44 years, as consistent with previous findings, for which the explanation proposed was an escalation of stress at a point of rising mid-life responsibilities (Ditlevsen & Elklit, 2010; Liberzon & Knox, 2012).

The low proportion of those with suicidality in our sample was surprising given the consistent association of PTSD with suicidality in other studies (Bentley et al., 2016; Galatzer-Levy et al., 2013; Hawgood & De Leo, 2008; Krysinska & Lester, 2010; Panagioti et al., 2009), and studies describing patients with PTSD and suicidal thoughts as having more severe depression and anxiety than other patients with PTSD (Krysinska & Lester, 2010). We would expect patients treated in secondary care to have greater symptom severity than those in primary care. Our observation that psychiatric admission was more likely in patients with PTSD reporting suicidality is consistent with the demonstrated risk of suicidal behaviour in populations diagnosed with PTSD and with mood and anxiety comorbidities (Galatzer-Levy et al., 2013). Our finding that 60% of individuals overall were taking antidepressants/antianxiety medication, increasing to 68% amongst those who reported suicidality, is consistent with research describing a greater risk of suicidality amongst individuals with PTSD not taking medication compared to those who are (Tarrier & Gregg, 2004). It is noteworthy, however, that NICE guidelines state that for individuals with PTSD, medication should not be used in preference to trauma-focused psychological therapy (NICE, 2018). The prevalence of receipt of antidepressants/anti-anxiety medication compared to that of psychological therapy in this sample do not reflect adherence to these guidelines. This is particularly concerning given the weak evidence to support use of psychotropic medication reducing risk of repeat self-harm (Hawton et al., 2016).

Strengths and limitations

A key strength of this study was that it used a large routine clinical database to describe treatment patterns in a naturalistic sample of patients treated by a secondary mental healthcare provider, presenting novel findings on how treatments received by patients with PTSD differ by their suicidality. Whilst this dataset gave us access to a relatively large sample size, it remains possible that associations arose by chance. The C&I database provides reliable and accurate information, with responsibility for data input lying with treating clinicians rather than clinical coders (ONS, 2013). This improved the validity of diagnostic data and reduced the chances that our sample included patients with a primary diagnosis of non-affective psychotic disorders (ICD-10 F20-F29) or borderline personality disorder (ICD-10 F60.3), both of which are independently associated with risk of suicidal behaviour (Arsenault-Lapierre et al., 2004). Our longitudinal design ensured that we were clear about the temporal sequence of events, reducing the chances that any associations observed were explained by reverse causality.

The main limitations of the study lie in missing data. As data were collected for clinical and not research purposes, data were not available for all potential confounders, for some variables we had incomplete information (Werbeloff et al., 2016) and we only captured information for those individuals who attended sessions. Additionally, this routine clinical database does not record the nature and severity of the traumatic event that led to the PTSD diagnosis and research shows this can influence the course and prognosis of the disorder (Howgego et al., 2005). To reflect clinical reality, this study did not exclude patients with PTSD who had secondary diagnoses of other psychiatric disorders and it is possible that suicidality occurred in the context of those other psychiatric disorders. A clinical study confined to those with PTSD but, no other diagnoses would explore the relationship between PTSD and suicidality specifically but would not reflect clinical reality. We note that other studies investigating suicidality in the context of specific psychiatric disorders have also included patients with comorbid psychiatric disorders, with findings representative of naturalistic clinical populations (Dold et al., 2018) and therefore more useful in reflecting real-world practice. Similarly, it is possible that prescribing in our sample reflected prescribing for a secondary diagnosis of depressive disorder and the suicidality associated with this disorder, given that first-line pharmacotherapy is similar for PTSD and depression (Bandelow et al., 2022; Bauer et al., 2017). It is possible that some patients in our study had undiagnosed PTSD for longer than others and this may have influenced outcomes (Brady et al., 2000). Additionally, it is possible that people may have been diagnosed with a primary

diagnosis of non-affective psychotic disorders at another point in time, prior to accessing C&I secondary care or prior to the period under investigation. Although we were able to conduct a time to event analysis for admission, due to valid recording of admission date, we were unable to do this for psychotropics as the date extracted by NLP for medication tends to relate to the clinical planning rather than actual receipt.

Our approach of complete case analysis led to 131 cases being dropped from the analysis, and it is possible that this introduced biases, particularly in relation to ethnicity and IMD. We did not compare the characteristics of those with and without data on all model covariates and this is a key limitation. Approximately a third of the patients in the C&I CRIS database do not have their ethnicity recorded in their EHRs (Werbeloff et al., 2018). It is possible that exclusion of these patients (many of whom may have been migrants with pre-migration trauma) may have biased estimates if the prevalence of suicidal ideation was higher in those who were excluded (Weberloff et al., 2016). We felt it important not to use multiple imputation for missing data, due to the biases introduced by that approach but, a shortfall of this study is not having assessed for differences between those who had missing data and those who did not.

As our data derive from only one Trust our findings may not be generalisable to clinical populations outside urban centres in the UK. Based on IMD scores obtained for 326 areas in England, Camden is the 74th most deprived area and Islington is the 14th (Werbeloff et al., 2016). Finally, as our study was limited to those who sought help and accessed secondary mental health services for PTSD, our findings may not be generalisable to the wider population of those with PTSD.

Clinical, policy and research outcomes

Further work is needed to investigate why a relatively low proportion of patients with PTSD (60% overall) receive psychological therapy compared to that for those who receive psychotropic medication (66% overall), apparently contradicting NICE guidelines that all individuals with a diagnosis of PTSD should receive psychological therapy as a first line treatment, rather than medication (NICE, 2018). Although therapy and psychotropic medication have equivalent efficacy (Bisson et al., 2007) psychological therapy addresses underlying pathology and may have longer-lasting effects through shifting cognitions. One explanation for this imbalance is the greater severity of PTSD treated in secondary care, including those who do not respond to first- and second-line treatments and those with comorbid conditions such as depression, for which antidepressants/antianxiety medication would also be prescribed (Rytwinski et al., 2013). It may also be possible that this reflects treatment preferences among secondary care patients with PTSD for medication over therapy. Trial evidence suggests that patients who choose their form of treatment, whether medication or therapy, improve more than those who receive treatment regardless of their preference (Zoellner et al., 2019). Qualitative research is needed to analyse the discourse between patients and clinicians in establishing treatment plans and the extent to which they might be regarded as collaborative. Our findings may also reflect the limited availability of psychological therapy within the NHS due to resource constraints, even despite economic modelling suggesting that antidepressants/anti-anxiety medication is less cost-effective than psychological interventions for PTSD (NICE, 2018). The high proportion of patients prescribed antipsychotics in this clinical setting (33% overall) reinforces the argument of a need for better recognition of psychosis symptoms as part of the broader clinical picture among trauma-exposed populations (Frost et al., 2019).

Future research should also focus on defining the clinical features of patients with PTSD and depression who experience suicidal thoughts, as other studies suggest that this specific comorbidity is associated with greatest risk of suicidality (Oquendo et al., 2003, 2005). Work to ascertain the relationship between specific combinations of symptoms (such as flashbacks and hopelessness) in engendering suicidal thoughts may help in tailoring trauma-informed approaches to discussing therapy and medication. Future epidemiological research should explore the timing of the onset of suicidal ideation in relation to PTSD diagnosis, and how this varies with types of trauma and specific features of PTSD, such as flashbacks (Tarrier & Gregg, 2004). Longer-term work in samples of this kind would ascertain the prognosis for patients with PTSD and suicidal thoughts who do not receive evidence-based treatment, whether not receiving therapy, not being prescribed anti-depressant/anti-anxiety medication, or receiving off licence antipsychotics. Such findings might also be informed by investigating the interactions with the type of index trauma. Novel trial designs that could investigate the clinical effectiveness of psychiatric admission in this patient population would also help inform revisions of treatment guidelines.

Conclusions

In this naturalistic clinical study of secondary care patients with PTSD we identified a relatively low proportion (6%) of patients who reported suicidality within the 6 months before or 6 months after a PTSD diagnosis. We also identified a lower proportion overall receiving therapy when compared with psychotropic medication, despite therapy being the first line treatment for PTSD. Patients with PTSD and suicidality in this sample were more likely than non-suicidal patients to be prescribed antipsychotics and benzodiazepines, to receive psychological therapy and to be admitted to a psychiatric ward or CRHTT but, were no more likely to receive anti-depressant/anti-anxiety medication. Whilst acknowledging the potential for under-recording of treatments received and the greater morbidity of secondary care PTSD patients, it remains possible that a high proportion of patients with PTSD do not receive evidence-based treatment, as defined in NICE guidelines.

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