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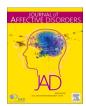*See next page for additional authors*

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Research paper

Prediction of suicidal behavior using self-reported suicidal ideation among patients with bipolar disorder

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ABSTRACT

Background: People with bipolar disorder have elevated suicide risk. We estimated the ability of the Patient Health Questionnaire (PHQ9) to predict suicide outcomes for outpatients with bipolar disorder.
Methods: Visits by adults with bipolar disorder who completed a PHQ9 were identified using electronic health record (EHR) data. Bipolar diagnoses and suicide attempts were ascertained from EHR and claims data, and suicide deaths from state and federal records. Depression severity was assessed via the first eight items of the PHQ9, while suicidal ideation was assessed by the ninth item.
Results: 37,243 patients made 126,483 visits. Patients reported at least moderate symptoms of depression in 49% and suicidal ideation in 30% of visits. Risk of suicide attempt was 4.21% in the subsequent 90 days for those reporting nearly daily suicidal ideation compared to 0.74% in those reporting none. Patients with nearly daily suicidal ideation were 3.85 (95% CI 3.32–4.47) times more likely to attempt suicide and 13.78 (95% CI 6.56–28.94) times more likely to die by suicide in the subsequent 90 days than patients reporting none. Patients with self-harm in the last year were 8.86 (95% 7.84–10.02) times more likely to attempt suicide in the subsequent 90 days than those without.
Limitations: Our sample was limited to patients completing the PHQ9 and did not include data on some important social risk or protective factors.
Conclusions: The PHQ9 was a robust predictor of suicide. Suicidal ideation reported on the PHQ9 should be considered a strong indicator of suicide risk and prompt further evaluation.

1. Introduction

People with bipolar disorder are at significantly higher risk of suicide attempt and death compared to the general population or to people with other mental health conditions (Ilgen et al., 2010; Rihmer and Kiss, 2002). In their lifetime, 20–60% of people with bipolar disorder attempt suicide, a rate nearly double those with unipolar depression (Chen and Dilsaver, 1996; Gonda et al., 2012). Additionally, suicide attempts made by people with bipolar disorder are more likely to be fatal than suicide attempts made by the general population (Baldessarini et al., 2006). All told, people with bipolar disorder have an estimated lifetime risk of

suicide death of 15–20%, a risk that is 20–30 times higher than the general population (Gonda et al., 2012; Miller and Bauer, 2014; Pompili et al., 2013).

Tools to diagnose and monitor depression, such as the Patient Health Questionnaire (PHQ9) (Kroenke et al., 2001), can help identify those at risk for suicide, but their utility is not well understood for people with bipolar disorder. Despite the PHQ9's ability to help identify patients at risk through its ninth item (Simon et al., 2019), which asks about thoughts of suicide or being better off dead, the cyclical nature of bipolar disorder and the higher prevalence of substance use disorder and impulsivity in this population may make item 9 of the PHQ9 less

predictive of suicidal behavior (Cerullo and Strakowski, 2007; Powers et al., 2013). This study examines the relationship between thoughts of suicide reported on the PHQ9, patient characteristics, and suicide attempts and death in the subsequent 30 and 90 days for adults with bipolar disorder receiving outpatient care across the U.S.

2. Methods

Electronic health record (EHR) and claims data from seven large integrated healthcare systems across the country that participate in the Mental Health Research Network were used to evaluate the relationship between suicidal ideation, as reported on PHQ9s collected as part of routine care, and subsequent fatal and non-fatal suicide attempts (Kroenke et al., 2001). Participating healthcare systems included HealthPartners (Minnesota, Wisconsin), Henry Ford Health System (Michigan), and Kaiser Permanente regions of Colorado, Hawaii, Northwest (Oregon and southwest Washington), Southern California and Washington state. Altogether, these health systems provide insurance and comprehensive healthcare to over eight million people. Members are insured through subsidized programs for low-income residents, capitated Medicaid or Medicare plans, individual insurance plans, and employer-sponsored plans, and are generally representative of each care system's service area in terms of age, race, ethnicity and socioeconomic status (Simon et al., 2016, 2013). Each healthcare system maintains a Virtual Data Warehouse (VDW) that follows the Health Care Systems Research Network data model (Ross et al., 2014). Each healthcare system's Institutional Review Board approved use of these de-identified data for research.

Visits between 1/1/2009 and 6/30/2015 by patients 18 years of age or older that were associated with a diagnosis of bipolar disorder (ICD-9 codes of 296.10 to 296.89) and a response to item 9 of the PHQ9 were included, except at Henry Ford, where visits after implementation of a new EHR system on 12/1/2012 were included. The primary analysis examined the relationship between suicidal ideation and suicide attempt or suicide death in the 30 and 90 days following a visit. Suicidal ideation was assessed via the ninth question of the PHQ9, which asks, "Over the last 2 weeks, how often have you had thoughts that you would be better off dead, or of hurting yourself?" Response options are "not at all" (score of 0), "several days" (1), "more than half the days" (2) and "nearly every day" (3) (Kroenke et al., 2009). The first eight questions of the PHQ9, known as the PHQ8, were used to measure depression severity to characterize the sample. Scores of 5–9 indicated mild depression, 10–14 moderate depression, 15–19 moderately severe depression, and 20–27 severe depression.

Suicide attempts included all injury and poisoning diagnoses from EHR or insurance claim data associated with an ICD-9 cause of injury code indicating self-harm (E950-958) or undetermined intent (E980-988). In previous work, we confirmed that injuries coded as undetermined were likely intentional self-harm, and as such are classified here as suicide attempts (Lu et al., 2014; Simon et al., 2013). Visits were excluded from analyses of suicide attempt if a patient disenrolled from the health plan during the follow-up windows, as suicide attempts may not be adequately captured using EHR data alone. Suicide deaths were assessed using state mortality records and the national death index; probable suicide deaths included those associated with any ICD-10 cause-of-death diagnosis of definite self-inflicted injury (X60-X84) or injury or poisoning with undetermined intent (Y10-Y34) (Bakst et al., 2016; Cox et al., 2017). Additional patient-level data extracted from EHR and claims data included age, sex, race/ethnicity, PHQ9 responses, emergency department visits, psychiatric hospitalizations and suicide attempts. Initial analyses described characteristics of patient visits associated with PHQ9 item 9 responses. Suicide attempt and death were observed for 30 and 90 days following each visit. If a patient made multiple visits during the 30 or 90 days prior to a suicide attempt or death, each visit was considered a separate occasion for predicting risk.

Bivariate analyses using chi-square tests assessed the association

between PHQ9 item 9 responses and suicide attempt or death in the 30 and 90 days following the visit. Odds ratios were estimated using generalized estimating equations with log link to account for multiple observations per person. Initial models estimated the odds of suicide attempt or death associated with PHQ9 item 9 responses. Models were then adjusted for comorbid psychiatric diagnoses (anxiety, substance use disorder), other potential risk factors (emergency department visits, psychiatric hospitalizations, previous suicide attempts) and site. All models were adjusted for demographic characteristics, including age, sex, race and ethnicity.

3. Results

Overall, 37,243 patients made 126,483 visits associated with a diagnosis of bipolar disorder and a PHQ9 item 9 score (Table 1). Most visits (91%) occurred in mental health specialty care, while 9% occurred in primary care. PHQ8 scores indicated symptoms of moderate depression in 21% of visits, moderately severe depression in 17% of visits, and severe depression in 11% of visits. Patients reported thoughts of suicide several days in the past 2 weeks for 18% of visits, more than half the days in 7% of visits, and nearly every day in 5% of visits. Nearly daily thoughts of suicide were most often reported in visits with young adults and least often in visits with older adults. Nearly daily suicidal ideation was reported most frequently in office visits made by Native Americans/Alaskan Native patients (6.7% of visits), Hawaiian/Pacific Islander patients (7.1%), Hispanic patients (6.8%) and patients of other or unknown race (6.7%). Nearly daily suicidal ideation was also reported more frequently in visits with patients who had comorbid anxiety or substance use disorders than in visits by those without these conditions and in visits with patients who had mental health emergency department visits or hospitalizations in the past year than in those without these types of visits. Nearly daily suicide ideation was particularly high (12.2%) in visits with patients who had a self-harm diagnosis in the past year. As expected, nearly daily suicidal ideation increased as the PHQ9 score increased.

There were 776 suicide attempts and 16 suicide deaths within 30 days and 1711 suicide attempts and 50 suicide deaths within 90 days of an office visit (Table 2). Suicide attempt risk was highest for those with nearly daily suicidal ideation, occurring within 90 days for 4.21% of visits compared to 0.74% of visits associated with a PHQ9 item 9 score of 0. Risk for suicide death was likewise highest for those with nearly daily suicidal ideation, occurring within 90 days for 0.24% of visits compared to 0.02% of visits associated with a PHQ9 item 9 score of 0. Having nearly daily suicidal ideation (PHQ9 item 9 score = 3) in the last year was similarly associated with suicide attempts and deaths in the 30 and 90 days following a visit, with scores of 3 more strongly associated with risk of suicide attempts and deaths than lower scores (Table 3).

The odds of suicide attempt in the 90 days following an outpatient visit are summarized in Table 4. The odds of suicide attempt increased with higher PHQ9 item 9 scores in unadjusted models, with suicide attempts 2.94 more likely (95% CI: 2.14 to 4.03) following a PHQ9 item 9 score of 1, 4.57 times more likely (95% CI: 3.45 to 6.06) following a score of 2, and 5.84 times more likely (95% CI: 3.39 to 10.05) following a score of 3 compared to a reference score of 0. The addition of other risk factors into the model (anxiety, substance use disorder, emergency department visits, inpatient stays, previous self-harm, PHQ8 score) attenuated the associations between PHQ9 item 9 score and suicide attempt to a small degree, but PHQ9 item 9 remained a robust predictor of suicide attempt. Having a self-harm diagnosis in the past year was most highly associated with risk of suicide attempt in the 90 days following a visit (OR: 8.86, 95% CI: 7.84–10.02), but all risk factors were significantly associated with risk of suicide attempt, with the exception of most PHQ8 scores.

The odds of suicide death in the 90 days following an outpatient visit are estimated in Table 5. The odds of suicide death generally increased as PHQ9 item 9 scores increased, and nearly daily thoughts of suicide

Table 1

Characteristics of 126,483 outpatient visits made by 37,243 patients with bipolar disorder by response to item 9 of the PHQ9.

	All Visits with Completed PHQ9 Item 9 scores		PHQ9 Item 9 score=0		PHQ9 Item 9 score=1		PHQ9 Item 9 score= 2		PHQ9 Item 9 score=3	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%
Total	126,483	100%	88,854	70.2	22,461	17.8	8432	6.7	6736	5.3
Age	X2 = 696, df=9, *p*< 001									
18 to 29	22,748	18%	15,041	66.1	4466	19.6	1873	8.2	1368	6.0
30 to 44	36,573	29%	25,351	69.3	6869	18.8	2461	6.7	1892	5.2
45 to 64	52,119	41%	36,703	70.4	9133	17.5	3438	7.6	2845	5.5
65 or older	15,043	12%	11,759	70.2	1993	13.2	660	7.8	631	4.2
Sex	X2-10.62, df=6, p=.10									
Female	90,100	71%	63,214	71.1	16,062	17.8	6074	6.7	4750	5.3
Male	36,380	29%	25,638	70.5	6399	17.6	2538	6.5	1985	5.5
Race	X2 = 167, df=18, *p*< 001									
White	103,106	82%	72,863	70.7	18,195	17.6	6660	6.5	5388	5.2
Black	5933	5%	4125	69.5	1095	18.5	422	7.1	291	4.9
Asian	3921	3%	2798	71.4	688	17.5	292	7.4	143	3.6
Native American/Alaskan Native	2730	2%	1901	69.6	432	15.8	213	7.8	184	6.7
Native Hawaiian/Pacific Islander	1967	2%	1305	66.3	360	18.3	163	8.3	139	7.1
Other or Unknown	8823	7%	5860	66.4	1691	19.2	682	7.7	590	6.7
Ethnicity	X2 = 63.6, df=6, *p*< 001									
Hispanic	7180	6%	4791	66.7	1365	19.0	536	7.5	488	6.8
Not Hispanic	119,300	94%	84,061	70.5	21,096	17.7	7896	6.6	6247	5.2
Location of visit	X2 = 62.1, df=3, *p*< 001									
Mental health specialty	115,604	91%	80,969	70.0	20,816	18.0	7722	6.7	6097	5.3
Primary care	10,879	9%	7885	72.5	1645	15.1	710	6.5	639	5.9
Anxiety Disorder Dx Past Yr.	X2 = 1024. Df=3, *p*< 001									
Yes	74,210	59%	49,267	66.9	14,359	19.3	5680	7.7	4544	6.1
No	52,273	41%	39,227	75.0	8102	15.5	2752	5.3	2192	4.2
Substance Use Dx Past Yr.	X2 = 881, df=3, *p*< 001									
Yes	25,153	20%	15,868	63.1	5207	20.7	2128	8.5	1950	7.8
No	101,330	80%	72,986	72.0	17,254	17.0	6304	6.2	4786	4.7
Mental Health Hosp. Past Yr.	X2 = 674, df=3, *p*< 001									
Yes	24,152	19%	15,618	64.7	4599	19.0	2012	8.3	1923	8.0
No	102,331	81%	73,236	71.6	17,862	17.5	6420	6.3	4813	4.7
Mental Health ED Visit Past Yr.	X2 = 955, df=3, *p*< 001									
Yes	33244	26%	21,475	64.6	6433	19.4	2747	8.3	2589	7.8
No	93,239	74%	67,379	72.3	16,028	17.2	5685	6.1	4147	4.4
Diagnosed Self-Harm in Past Yr.	X2 = 1354, df=3, *p*< 001									
Yes	5049	4%	2469	48.9	1279	25.3	683	13.5	618	12.2
No	121,434	96%	86,385	71.1	21,182	17.4	7749	6.4	6118	5.0
Total PHQ8 Score at Visit	X2 = 35276, df=9, *p*< 001									
0 to 9	56,769	48%	51,004	90.0	4907	8.6	547	1.0	211	0.4
10 to 14	26,202	22%	17,334	66.2	6598	25.2	1636	6.2	634	2.4
15 to 19	21,383	18%	10,338	48.3	6055	28.3	3152	14.7	1838	8.6
20 or higher	13,672	12%	4312	31.5	3253	23.8	2478	18.1	3629	26.5
Maximum PHQ9 Item 9 Response in Past Year	X2 = 147815, df=9, *p*< 001									
0 (Not at all)	68,601	54%	68,601	100	n/a		n/a		n/a	
1 (Several days)	29,596	23%	13,530	45.7	16,066	54.3	n/a		n/a	
2 (More than half the days)	14,189	11%	3915	27.6	3903	27.5	6371	44.9	n/a	
3 (Nearly every day)	14,097	11%	2808	19.9	2492	17.7	2061	14.6	6736	47.8

Table 2

Suicide attempts and deaths in the 30 and 90 days following index outpatient visit with a diagnosis of bipolar disorder according to *response at the index visit on PHQ9 item 9*.

	Total		Item 9 Response at Index Visit							
			Not at all		Several days		More than half the days		Nearly every day	
At Risk for Suicide Attempt	126,251		88,697		22,425		8412		6717	
Attempt Within 30 days	776	0.61%	269	0.30%	233	1.04%	133	1.58%	141	2.10%
Attempt Within 90 days	1711	1.36%	663	0.74%	485	2.16%	280	3.32%	283	4.21%
At Risk for Suicide Death	117,596		82,573		20,922		7825		6276	
Death Within 30 days	16	0.01%	5	< 0.01%	8	0.04%	2	0.02%	1	0.02%
Death Within 90 days	50	0.04%	14	0.02%	7	0.03%	4	0.05%	15	0.24%

were a very robust predictor of suicide death, to the point where adjustment for other risk factors did not attenuate the association between item 9 PHQ9 scores of 3 and suicide death (unadjusted OR=14.13, 95% CI: 5.59 = 35.69; adjusted OR=13.78, 95% CI: 6.56–28.94). Similar to suicide attempts, the addition of other risk factors into the model mildly attenuated the associations between PHQ9 item 9 score and suicide death, but it remained a powerful predictor of suicide death. Unlike suicide attempts, other risk factors (anxiety, substance use disorders, healthcare utilization, self-harm in the past year, PHQ8) were not significantly associated with risk of suicide death, likely due to the relatively small sample size of suicide deaths.

Table 3

Suicide attempts and suicide deaths within 30 days and 90 days following index outpatient visit with a diagnosis of bipolar disorder according to *maximum PHQ9 item 9 score in the prior year*.

	Total		Maximum Item 9 Response in Past Year							
			Not at all		Several days		More than half the days		Nearly every day	
At Risk for Suicide Attempt	126,251		68,475		29,549		14,161		14,066	
Attempt Within 30 days	776	0.61%	143	0.21%	225	0.76%	170	1.20%	238	1.69%
Attempt Within 90 days	1711	1.36%	395	0.58%	472	1.60%	372	2.63%	472	3.36%
At Risk for Suicide Death	117,596		63,734		27,646		13,182		13,034	
Death Within 30 days	16	0.01%	3	< 0.01%	5	0.02%	2	0.02%	6	0.05%
Death Within 90 days	50	0.04%	10	0.02%	13	0.05%	5	0.04%	22	0.17%

Table 4

Odds of suicide attempt in the 90 days following an outpatient visit with a diagnosis of bipolar disorder.

	Model 1: Item 9 response at index visit*		Model 2: Item 9 response at index visit** and other risk factors		Model 3: Item 9 response at index visit** and other risk factors and PHQ8 score	
	Odds Ratio	95% CI	Odds Ratio	95% CI	Odds Ratio	95% CI
PHQ9 Item 9 Score						
Not at all	1	Reference	1	Reference	1	Reference
Several days	2.94	2.14–4.03	2.39	2.11–2.69	2.20	1.94–2.54
More than half	4.57	3.45–6.06	3.26	2.82–3.78	3.09	2.61–3.66
Nearly every day	5.84	3.39–10.05	3.85	3.32–4.47	3.83	3.20–4.60
Other Risk Factors						
Anx. Dx. In past yr			1.22	1.09–1.36	1.21	1.08–1.36
SUD Dx in past yr			1.17	1.05–1.31	1.17	1.04–1.31
MH ED visit in last yr			1.39	1.24–1.56	1.48	1.31–1.67
MH IP stay in last yr			1.24	1.09–1.40	1.20	1.05–1.36
Self-harm DX last yr			8.86	7.84–10.02	8.72	7.67–9.92
PHQ8 Score						
< 10					1	Reference
10–14					1.04	0.87–1.25
15–19					1.30	1.16–1.52
>= 20					1.09	0.94–1.27

* Chi Square = 128, df=3, $p < 001$.

Table 5

Odds of suicide death in the 90 days following an outpatient visit with a diagnosis of bipolar disorder.

	Model 1: Item 9 response at index visit*		Model 2: Item 9 response at index visit** and other risk factors		Model 3: Item 9 response at index visit** and other risk factors and PHQ8 score	
	Odds Ratio	95% CI	Odds Ratio	95% CI	Odds Ratio	95% CI
PHQ9 Item 9 Score						
Not at all	1	Reference	1	Reference	1	Reference
Several days	4.80	2.22–10.38	4.83	3.37–9.84	5.11	2.33–11.33
More than half	3.02	0.98–9.26	3.00	0.98–9.16	2.89	0.86–9.77
Nearly every day	14.13	5.59–35.69	13.78	6.56–28.94	11.37	4.40–29.38
Other Risk Factors						
Anx. Dx. In past yr			0.75	0.42–1.34	0.73	0.41–1.32
SUD Dx in past yr			0.69	0.33–1.42	0.70	0.33–1.46
MH ED visit in last yr			1.26	0.64–2.46	1.18	0.60–2.34
MH IP stay in last yr			1.27	0.61–2.66	1.21	0.57–2.58
Self-harm DX last yr			1.56	0.57–4.26	1.68	0.61–4.63
PHQ8 Score						
< 10					1	Reference
10–14					0.80	0.32–2.02
15–19					0.97	0.39–2.39
>= 20					1.58	0.63–3.96

* Chi Square = 33.4, df=3, $p < 001$.

4. Discussion

Item 9 of the PHQ9 was a robust predictor of suicide attempts and deaths for outpatients with bipolar disorder in the 30 and 90 days following PHQ9 administration, similar to results found in other patient populations, including general mental health outpatients, patients with psychosis, or patients with substance use disorders (Simon et al., 2016, 2019; Yarborough et al., 2021). Any concerns that PHQ9 item 9 may not predict suicide behaviors as well for people with bipolar disorder, given that the course of the disease can fluctuate and be associated with impulsivity, are unsupported by our results. Accurately identifying people with bipolar disorder at risk for suicide is particularly important given that bipolar disorder has the strongest association with suicide of

any psychiatric diagnoses, with lifetime rates of suicide attempts estimated to be 20–60% (Gonda et al., 2012; Ilgen et al., 2010; Rihmer and Kiss, 2002). People with bipolar disorder also tend to use more lethal means of suicide, leading to a lower ratio of 3 attempts for each completed suicide in those with bipolar disorder, compared to 30 attempts for each completed suicide in the general population (Baldessarini et al., 2006).

Patients with bipolar disorder reported relatively heavy burdens of depression symptoms and suicidal ideation. Patients with bipolar disorder reported at least moderate depression (PHQ8 >9) in 52% of encounters and thoughts of suicide in 46% of encounters. Similarly, in a study of 954 people with bipolar disorder from 29 countries who

responded to the WHO World Mental Health survey, 43% reported suicidal ideation in the past year, a stark contrast to a 9.2% *lifetime* prevalence of suicidal ideation in the general population (Merikangas et al., 2011; Turecki and Brent, 2016; World Health Organization, 2014). Additionally, 16% of patients with bipolar disorder reported a suicide attempt in the past year (Merikangas et al., 2011). Our and other study findings point to the utmost importance of suicide prevention in this population. Our study indicates that PHQ9 item 9 can be an important tool to recognize patients with bipolar disorder who are at particularly elevated risk of suicide. Evidence-based interventions are available for clinicians to further assess and treat suicide risk, including safety planning, lethal means assessment, and treatment of underlying psychiatric illnesses (Stanley et al., 2018; Yip et al., 2012).

Several factors further increased risk of suicide attempt in our sample of patients with bipolar disorder. The risk of suicide attempt was higher in those with anxiety or substance use disorder, similar to previous studies indicating an elevated risk of suicide for those with these conditions, especially substance use disorders (Chesney et al., 2014). Additionally, indications of psychiatric emergency or inpatient care in the last year conveyed elevated risk. Suicide risk was highest for those who had a self-harm diagnosis in the past year, with risk of suicide attempt in the subsequent 90 days nearly nine times higher than those without a self-harm diagnosis. This is consistent with other studies that have found the strongest indicator for future suicide attempt to be prior suicide attempt (2014). A study in Sweden that followed 1044 patients with previous suicide attempts (not limited to patients with bipolar disorder) found that 7.2% of patients died by suicide, with over half of those suicide deaths occurring within five years of the initial suicide attempt. Strikingly, the elevated risk persisted for at least 32 years (Probert-Lindström et al., 2020). In our study, PHQ9 item 9 response was a good predictor of suicide attempt – and even better when other risk factors like anxiety, substance use and past-year self-harm were included in the model – but PHQ9 item 9 was an even stronger predictor of suicide death, to the point where the addition of other risk factors did not significantly improve its prediction. Interestingly, for the most part, total PHQ8 scores, a surrogate for depression severity, were not predictive of suicide attempts and deaths. This finding further highlights the importance of the ninth question of the PHQ9, which asks about thoughts of suicide and self-harm, as this question was significantly predictive of suicide outcomes.

5. Limitations

There are several potential limitations to our study. First, despite our large sample size, there were a small number of suicide deaths within 30 and 90 days. Second, our sample was limited to patients seeking care in integrated healthcare systems and completing the PHQ9, and may not be generalizable to other populations. Third, identification of patients with bipolar disorder relied on clinical diagnoses rather than structured assessments, and reflect diagnoses made in clinical practice. Fourth, we were unable to measure important risk factors for suicide that were not recorded in the EHR as structured data, such as family history of suicide, stressful life events, employment status, age of onset, rapid cycling, duration of untreated illness or severity of illness (Beyer and Weisler, 2016; Dome et al., 2019). We were also unable to measure certain protective factors, including use of lithium, which has been found to reduce risk of suicide death by 4–5 fold (Cipriani et al., 2013). Fifth, we were only able to identify suicide attempts for which patients sought care. However, many of the limitations described above are also encountered by front-line clinicians, and therefore our findings likely mirror real-world practice, as clinicians often don't have many of the aforementioned alternative sources of data when making clinical decisions. Ultimately, we think the strengths of this study, including a large and diverse sample of patients with bipolar disorder with extensive longitudinal EHR data, outweigh these potential limitations.

6. Conclusion

PHQ9 item 9 was a robust predictor of suicide attempts and deaths for outpatients with bipolar disorder. Although some may consider the PHQ9 to be a depression-specific measure, our work has demonstrated that item 9 of the PHQ9 can accurately identify people at increased risk of self-harm among people with bipolar disorder, psychotic disorders and substance use disorders (Simon et al., 2019; Yarborough et al., 2021). The ability to use one tool to assess risk across populations improves the likelihood that clinicians will become familiar with the tool and more likely to utilize it to assess risk. In sum, suicidal ideation reported in clinical encounters on the PHQ9 should be considered a strong indicator of suicide risk in patients with bipolar disorder and prompt further evaluation.

CRediT authorship contribution statement

Rebecca C. Rossom: Conceptualization, Writing – original draft, Writing – review & editing. **Bobbi Jo Yarborough:** Conceptualization, Writing – review & editing. **Jennifer M. Boggs:** Conceptualization, Writing – review & editing. **Karen J. Coleman:** Conceptualization, Writing – review & editing. **Brian K. Ahmedani:** Conceptualization, Writing – review & editing. **Frances L. Lynch:** Conceptualization, Writing – review & editing. **Yihe Daida:** Conceptualization, Writing – review & editing. **Gregory E. Simon:** Conceptualization, Writing – review & editing, Formal analysis.

Declaration of Competing Interest

The authors have no relevant financial interests or other potential conflicts of interest to declare.

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