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A primary care first (PCP-first) model to screen and treat depression: A VitalSign[6] report from a second cohort of 32,106 patients

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ABSTRACT

Purpose: This report from VitalSign[6] project describes treatment selection, follow-up rates and remission outcomes by initial depression severity using the PCP-FIRST model.
Methods: This retrospective analysis included 32,106 patients aged ≥12 years screened with the Patient Health Questionnaire 2-item (PHQ-2) from November 2016 to July 2019 across 37 primary care clinics. PHQ-2 positive-screen patients (PHQ-2 ≥ 3) received 9-item PHQ (PHQ-9) and 7-item Generalized Anxiety Disorder scales, clinician assessments, and evaluation for pharmacotherapy management with measurement-based care (MBC).
Results: Of PHQ-2 screened patients, 18.7% (5994/32,106) were positive and received a PHQ-9. Of 5994 patients with PHQ-9, 2571 received a clinical diagnosis of depression of whom, 333 had none-mild depression (PHQ-9 < 10) and 2238 had moderate-severe depression (PHQ-9 ≥ 10). Of the 333 patients with none-mild depression and 2238 patients with moderate-severe depression, 266 and 1929 had at least 18 weeks of data available. Of these, 54.9% (146/266) with none-mild depression and 69.1% (1332/1929) with moderate-severe depression were started on pharmacotherapy. Of the 1478 patients with clinical diagnosis of depression, initiated on pharmacotherapy, 1046 returned for ≥1 follow-up and 616 returned for ≥3 follow-ups over 18 weeks. Of the 1046 patients with ≥1 follow-up visit within 18 weeks, remission rates for patients with mild depression, moderate-severe depression, and overall were 55.6% (66/99), 30% (282/941), and 32.4% (338/1040) respectively.
Conclusions: Despite this being a real-world, usual care sample, remission outcomes exceed real world remission rate expectations of 6% in primary care.

1. Introduction

Major depressive disorder (MDD) affects up to 10% of adults in the United States annually, but the use of effective treatments is suboptimal with an average of eight years between onset of MDD to treatment initiation [1,2]. The United States Preventative Services Task Force (USPSTF) has recommended universal screening for depression in individuals 12 years or older [3,4]. Depression screening and treatment in outpatient settings, however, remains poor, with over half of MDD cases being undetected [5–7]. In a national cross-sectional study of U.S. outpatient primary care visits, as few as 3% to 4% involved depression screening [8].

To address this problem, VitalSign[6] was developed based on a Primary Care First (PCP-First) model where primary care providers (PCPs)

Abbreviations: PHQ-2, Patient Health Questionnaire-2; PHQ-9, Patient Health Questionnaire-9; MDD, Major depressive disorder; PCP-FIRST, Primary Care First Model; USPSTF, United States Preventative Services Task Force; VS[6], VitalSign[6] software; MBC, Measurement-based care; PHQ-A, Patient Health Questionnaire for Adolescents; GAD-7, Generalized Anxiety Disorder 7; DSM5, Diagnostic and Statistical Manual 5th edition; ADHD, Attention-deficit/hyperactivity disorder; STAR*D, Sequenced Treatment Alternatives to Relieve Depression.

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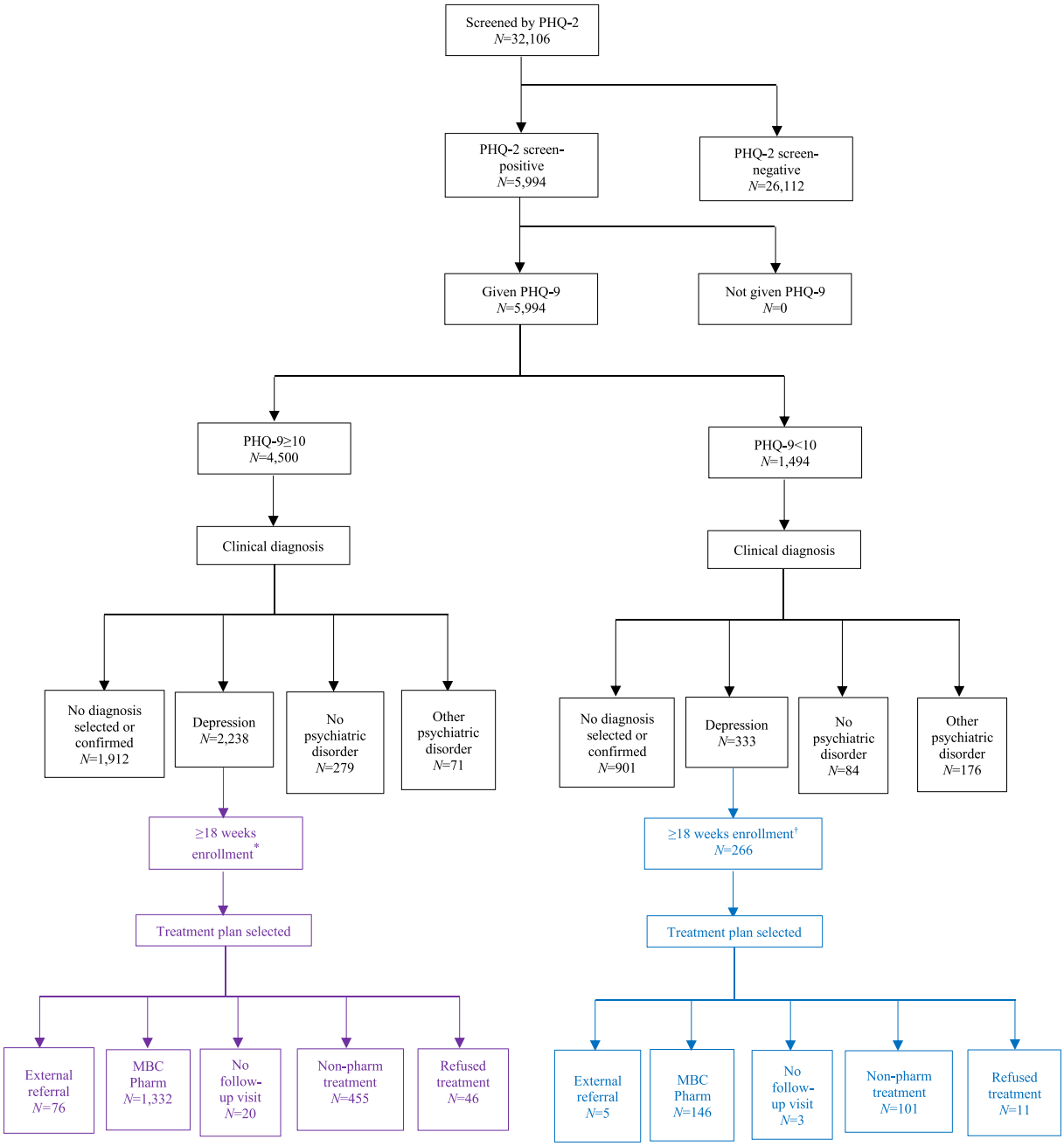

Fig. 1. Flowchart of depression screening and treatment in primary care clinics ($N = 37$).
*1929 patients with moderate-severe depression followed for at least 18 weeks (shown in purple).
†266 patients with none-mild depression followed for at least 18 weeks (shown in blue). (For interpretation of the references to colour in this figure legend, the reader is referred to the web version of this article.)

status. [25] There are a variety of reasons providers and patients may elect to begin treatment with an antidepressant even in the absence of moderate to severe symptoms, such as convenience, evidence of the start of relapse, or troublesome functional impairment. While we cannot know all the details to evaluate the rationale for prescribing practices, it is noteworthy that over 90% of patients entering MBC pharmacotherapy had moderate-severe depression based on PHQ-9.

Remission rates for patients with moderate-severe depression at ≥2 follow-ups and by study end are comparable to that of other effectiveness studies of MBC pharmacology treatment for outpatients with depression [11,21], and higher than that of real-world collaborative care clinics [10]. A large effectiveness study of collaborative care for depression showed respective 3- and 6-month remission rates of 18% and 19% for clinics receiving basic support, and 25% and 29% for clinics receiving enhanced support, which included on-going technical support and implementation support for 3–6 months before and 12 months afterwards [21]. In this study, patients with two PHQ-9 scores within 12 month and 3–6 months of follow-up data were included.

Previously, the first VitalSign[6] cohort had a higher remission rate at ≥3 follow-ups (41.3%), but also included patients with none-mild depression that tend to have high remission, which could account for the discrepancy [12]. Here, we showed overall, mild, and moderate-severe depression remission rates separately.

Attrition improved compared to the first VitalSign[6] cohort: 75% of patients on MBC pharmacotherapy returned for at least 1 follow-up; over half returned for a second visit, and 40% returned for ≥3 visits,

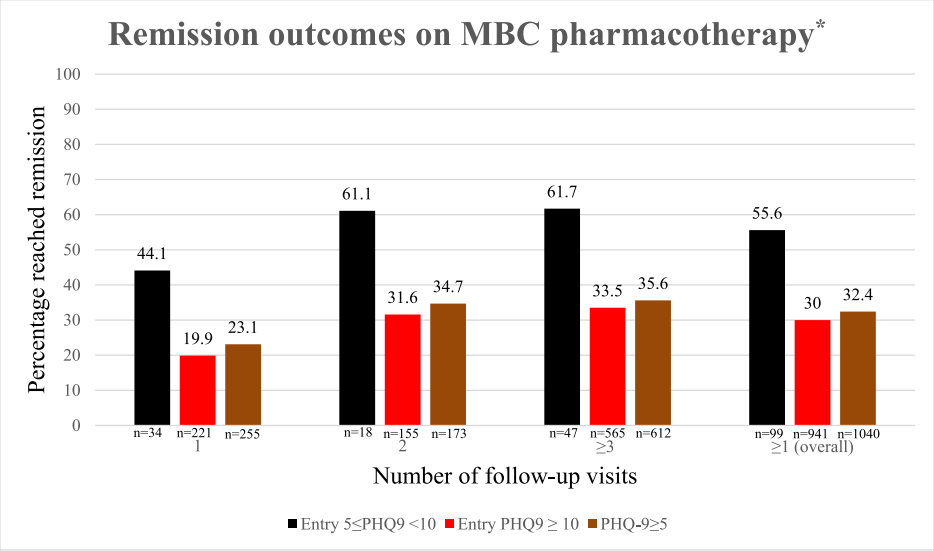

Fig. 2. Remission outcomes of patients on MBC pharmacotherapy with ≥1 follow-up visit and 18+ weeks enrollment ($N = 1040$) stratified by entry PHQ-9. The x-axis indicates remission by number of follow-up visits (225 patients total with 1; 173 total patients with 2; 612 total patients with 3; and overall, for 1040 summative patients at the end of 18 weeks).
Remission = PHQ < 5. MBC = measurement-based care.
*Of 1478 patients were placed on MBC pharmacotherapy, 400 patients had no follow-up and 32 patients with follow-up who did not complete an exit PHQ-9 were excluded from analysis. Of 1046 remaining patients, 6 participants had starting PHQ-9 < 5 and were excluded.

compared to 30.2%, 12.6%, 11.6%, respectively, in the first cohort [12]. Improved patient retention is likely due to continued VitalSign[6] team implementation efforts and better clinic workflow integration over time [26].

In this VitalSign[6] cohort, two out of three patients were managed by primary care providers using pharmacotherapy, one out of four were monitored without pharmacotherapy or psychotherapy, and less than one out of twenty were externally referred, demonstrating that this approach can assist clinics with independent depression management without a specialist on staff. Nationally, only 28.7% of PHQ-2 screen-positive patients and one-fifth of those with more severe psychological distress received any treatment, and were more likely to receive treatment from psychiatrists/mental health specialists than PCPs [27]. Although the collaborative care model has shown improvement in remission and response rates compared to usual care in the context of randomized controlled trials [28,29], implementation into real-world health systems has not always shown improvement [22]. VitalSign[6] could be integrated along with collaborative care approaches or implemented prior to adapting a collaborative care model that faces challenges of systems-level reimbursement, onsite masters-level care managers, frequent contact with a psychiatrist and an extended implementation process [9]. Further research is needed to understand which clinics are most successful at implementing VitalSign,[6] and continual feedback with program revision is needed to continue to improve program implementation.

Despite decreased attrition rates, patient retention remains a challenge to MBC treatment in primary care. Up to 29% of those identified through screening and placed on MBC pharmacotherapy did not return and only about 40% of patients returned for ≥3 visits over 18 weeks. The attrition rate is higher than that of Sequenced Treatment Alternatives to Relieve Depression (STAR*D) study (26% attrition by 12 weeks) [30], although STAR*D had the benefit of research trial coordinators who could assist with patient adherence, whereas real-world clinics may encounter limited resources leading to challenges with scheduling follow-ups. Possible methods to improve patient retention could be psychoeducation, addressing treatment barriers (e.g. transportation issues, stigma, etc.), or support for appointment scheduling and reminders [31]. Telehealth, which has been widely used since the Covid-19 pandemic, could also be a strategy to increase retention and access to care.

This study represents one of the largest registries of patients with depression treated in outpatient primary care clinics and offers an assessment of how PCPs can independently manage depression using health technology and with limited specialist assistance. Low-income, minority patients make up a substantial proportion of the study patients, making results applicable to clinics serving this demographic as well.

Among study limitations, sociodemographic data and other data were commonly missing. In addition, because this was a quality improvement program, there was not a research-level diagnosis, so we are unable to evaluate the accuracy of the diagnoses. As part of the VitalSign[6] program, we provided robust training for providers around diagnosis and treatment, yet there are no data available to confirm diagnostic criteria. There was also no systematic collection of relevant factors influencing likelihood of remission, including psychiatric comorbidities, differential diagnoses for screen-positive patients not diagnosed with a depressive disorder, and disease and episode duration. This limits analyzing covariates that influence screening, treatment decisions, and outcomes, and limits understanding of why some screen-positive patients are not given a diagnosis or have an unconfirmed diagnosis. Another limitation is that the remission rate was calculated for patients who remained enrolled for at least 18 weeks and engaged in care, rather than all patients diagnosed with depression, as the remission status of patients who did not follow-up would not be known. Though attrition drastically improved from the first cohort, engagement in care continues to remain a major concern. While measurement-based care approaches utilize self-report assessments of adherence, this report is limited by lack of other adherence-related measures such as pharmacy records (dispensation of prescriptions) or electronic monitoring systems.

Our focus in this manuscript was on PCP-delivered pharmacotherapy. However, almost one out of four patients with moderate-severe depression and one out of three patients with mild depression were treated with non-pharmacological interventions. As noted in the methods, non-pharmacological interventions were varied, and could include evidence-based psychotherapy, exercise, supportive therapy, etc. Non-pharmacological treatment also included active monitoring by