How Access Programs Can Improve Clinician Capacity to Manage Bipolar Disorder

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Lifeline for moms

University of Massachusetts UMASS Medical School

Bipolar disorder disproportionately affects perinatal women

Pooled prevalence of bipolar disorder in all perinatal women

Studies included	Pooled prevalence (%)	95% CI	Heterogeneity index (I^2)
All studies (n = 11)	**2.6**	**1.2 – 4.5**	**92%**

Masters GA, Hugunin J, Xu L, et al. Prevalence of bipolar disorder in perinatal women: A systematic review and meta- analysis. *Under Review.*

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Pooled prevalence of <u>mood episodes</u> in perinatal women WITHOUT history of psychiatric illness

Studies included	Pooled prevalence (%)	95% CI	Heterogeneity index (I^2)
Any episode (n = 10)	20.1	16.0 – 24.5	91%

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Pooled prevalence of mood episodes in perinatal women WITHOUT history of psychiatric illness

Studies included	Pooled prevalence (%)	95% CI	Heterogeneity index (I^2)
Any episode (n = 10)	**20.1**	**16.0 – 24.5**	**91%**

11.1 – 45.6%
Depressive episodes

17.5 – 31.6%
Hypomanic/manic/mixed episodes

Masters GA, Hugunin J, Xu L, et al. Prevalence of bipolar disorder in perinatal women: A systematic review and meta- analysis. *Under Review.*

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Studies included	Pooled prevalence (%)	95% CI	Heterogeneity index (I^2)
Any episode (n = 10)	20.1	16.0 – 24.5	91%

Pooled prevalence of mood episodes in perinatal women WITH a history of a mood disorder

Studies included	Pooled prevalence (%)	95% CI	Heterogeneity index (I^2)
Any episode (n = 7)	54.9	39.2 – 70.2	89%

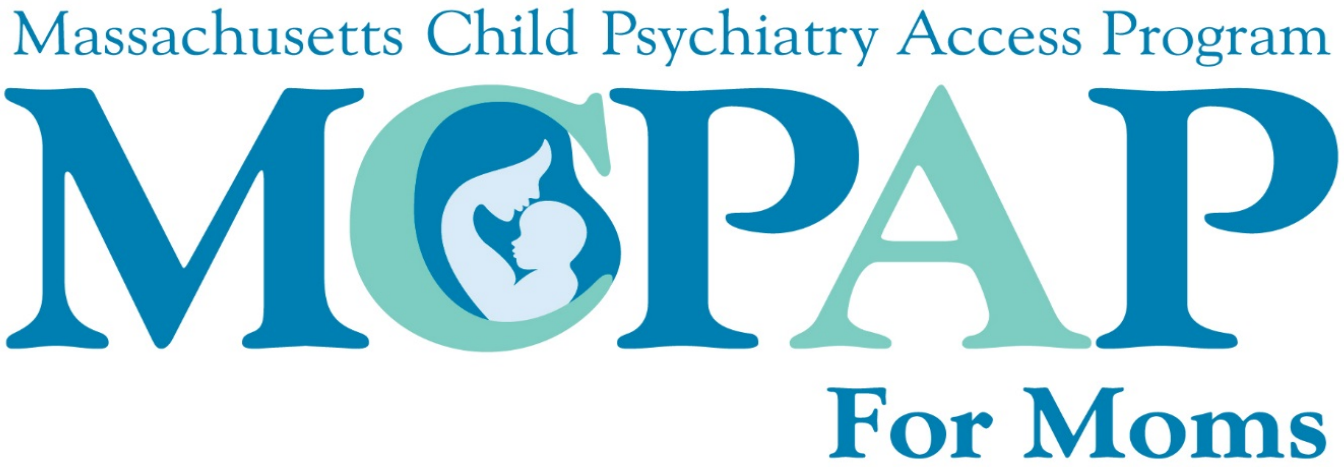
Masters GA, Hugunin J, Xu L, et al. Prevalence of bipolar disorder in perinatal women: A systematic review and meta- analysis. *Under Review.*

Bipolar disorder disproportionately affects perinatal individuals

Assessment and treatment for BD are complicated

Wide gaps in access to MH care, especially for bipolar disorder

Solutions including helping front-line clinicians to address mental health in the obstetric setting



Resources and Referrals

Education

Perinatal Psychiatry Consultation

- **Phone consults**
- **One-time assessments**

Adapted from: Byatt N, Straus J, Stopa A, et al. (2018) Massachusetts Child Psychiatry Access Program for Moms: Utilization and Quality Assessment . . .

Question: What are the attitudes of obstetric professionals towards incorporating BD into their care? How might MCPAP for Moms affect them?

Aim

Elucidate how MCPAP for Moms impacts attitudes towards management of bipolar disorder in the perinatal period, and specify clinician-level barriers and facilitators, and recommendations to improving management

Qualitative analyses

Focus groups (3) with obstetric professionals (**n = 31)** were conducted to discuss experiences, barriers, facilitators, and solutions to caring for perinatal individuals with BD

- Obstetric professionals = physicians, midwives, nurses, support staff
- Professionals could have exposure to MCPAP for Moms (**n = 24)** or no exposure **(n = 7),** to examine how this affected their responses

A modified grounded theory was used to analyze qualitative data and identify themes

- Coding and consensus completed by two independent researchers
- Themes were also examined across exposure levels for associations

Obstetric professional participants

	No exposure (n = 7)	**MCPAP for Moms exposure** (n = 24)
Screen for bipolar disorder	2 (29%)	17 (74%)

Masters GA, Xu L, Cooper K, et al. Perspectives on addressing and treating bipolar disorder in the obstetric setting. *Under Review.*

<u>Thematic group 1:</u> Participants with support see addressing perinatal BD as an important part of their role as obstetric professionals

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"I do [think managing BD is part of our role]…in conjunction with psychiatry and other support services…it's a multidisciplinary treatment, right? You need therapists, social workers, psychiatrists, OBs…we could all work together."

- Provider exposed to MCPAP for Moms

Quotes is slightly modified (brackets) to help contextualize response to interview probe or another participant's comment.

Thematic group 1: Participants with support see addressing perinatal BD as an important part of their role as obstetric professionals

- Participants with exposure to MCPAP for Moms perceive their patients as willing to be treated for BD by their obstetric clinicians and will talk about their mental health

- Screening is occurring sporadically in places without Access Program exposure. Without adequate support, participants report seeing no point in screening

<u>Thematic group 1:</u> Participants with support see addressing perinatal BD as an important part of their role as obstetric professionals

"Why screen for something that we can't do anything about?"

- Provider not exposed to MCPAP for Moms

Thematic group 1: Participants with support see addressing perinatal BD as an important part of their role as obstetric professionals

- Participants with exposure to MCPAP for Moms perceive their patients as willing to be treated for BD by their obstetric clinicians and will talk about their mental health

- Screening is occurring sporadically in places without Access Program exposure. Without adequate support, participants report seeing no point in screening

- Patient assessment is one of the most challenging parts in addressing BD in perinatal patients for all obstetric clinicians

- With appropriate support, clinician participants can be comfortable in treating patients with medications for BD

Thematic group 1: Participants with support see addressing perinatal BD as an important part of their role as obstetric professionals

"I'm a lot less scared to prescribe medications than I was probably four years ago because I see [that] the benefit outweighs the risks. So, I won't start somebody on a bipolar medication if I think they're bipolar. But if they've been on it and I call and I talk to [a MCPAP psychiatrist] and we [talk through] the case and they think it's appropriate, then I will happily prescribe it."

- Provider exposed to MCPAP for Moms

Quotes is slightly modified (brackets) to help contextualize response to interview probe or another participant's comment.

Thematic group 2: Systemic factors affect obstetric professionals' ability to address BD in the obstetric setting

- Formal education about BD in perinatal patients is lacking. Exposure to continuing education can help

Masters GA, Xu L, Cooper K, et al. Perspectives on addressing and treating bipolar disorder in the obstetric setting. *Under Review.*

Thematic group 2: Systemic factors affect obstetric professionals' ability to address BD in the obstetric setting

"I've certainly been to enough lectures now where the topic is untreated depression [and] here's all the bad things that could happen. So, it used to be no medications is best and we're going to take people off of their antidepressants. And it's certainly not [best]. I feel like we have a different mentality about that."

- Provider exposed to MCPAP for Moms

Quotes is slightly modified (brackets) to help contextualize response to interview probe or another participant's comment.

Thematic group 2: Systemic factors affect obstetric professionals' ability to address BD in the obstetric setting

- Formal education about BD in perinatal patients is lacking. Exposure to continuing education can help

- There are few mental health clinicians nationwide. Access Programs and collaboration with other professionals that have specialized mental health training can help to fill some of these gaps

- Coordination of care with outside psychiatric professionals remains a challenge for all participants, regardless of exposure

Masters GA, Xu L, Cooper K, et al. Perspectives on addressing and treating bipolar disorder in the obstetric setting. *Under Review.*

Thematic group 2: Systemic factors affect obstetric professionals' ability to address BD in the obstetric setting

"I would tell the residents that pregnancy's the only condition in medicine that you get to freely discriminate against. So, all these doctors just drop the ball and run when they see a pregnant patient. I'm talking about from the first pregnancy test…including your dentist."

- Provider exposed to MCPAP for Moms

Thematic group 3: Recommendations for integrating the treatment of BD into the obstetric setting

- Obstetric professional comfort and competency in managing perinatal BD may be increased with educational efforts and easily accessible resources

- Incorporation of the management of BD in the obstetric setting may be further facilitated by recommending efficient ways to integrate practices into existing workflows

- Employment of integrated care models and other innovative care delivery methods for patients and babies

Masters GA, Xu L, Cooper K, et al. Perspectives on addressing and treating bipolar disorder in the obstetric setting. *Under Review.*

Obstetric professionals are willing to provide mental health care to patients with BD with adequate support

- MCPAP for Moms may be able to help providers feel comfortable in treating perinatal patients with BD.

- Help to bridge gaps in care that exist in the community

Question: Does MCPAP for Moms utilization build capacity of clinicians to address BD? Does type of service used influence these outcomes?

Aim

Characterize the extent to which MCPAP for Moms builds obstetric clinician capacity to address bipolar disorder

Longitudinal analyses of MCPAP for Moms encounter data

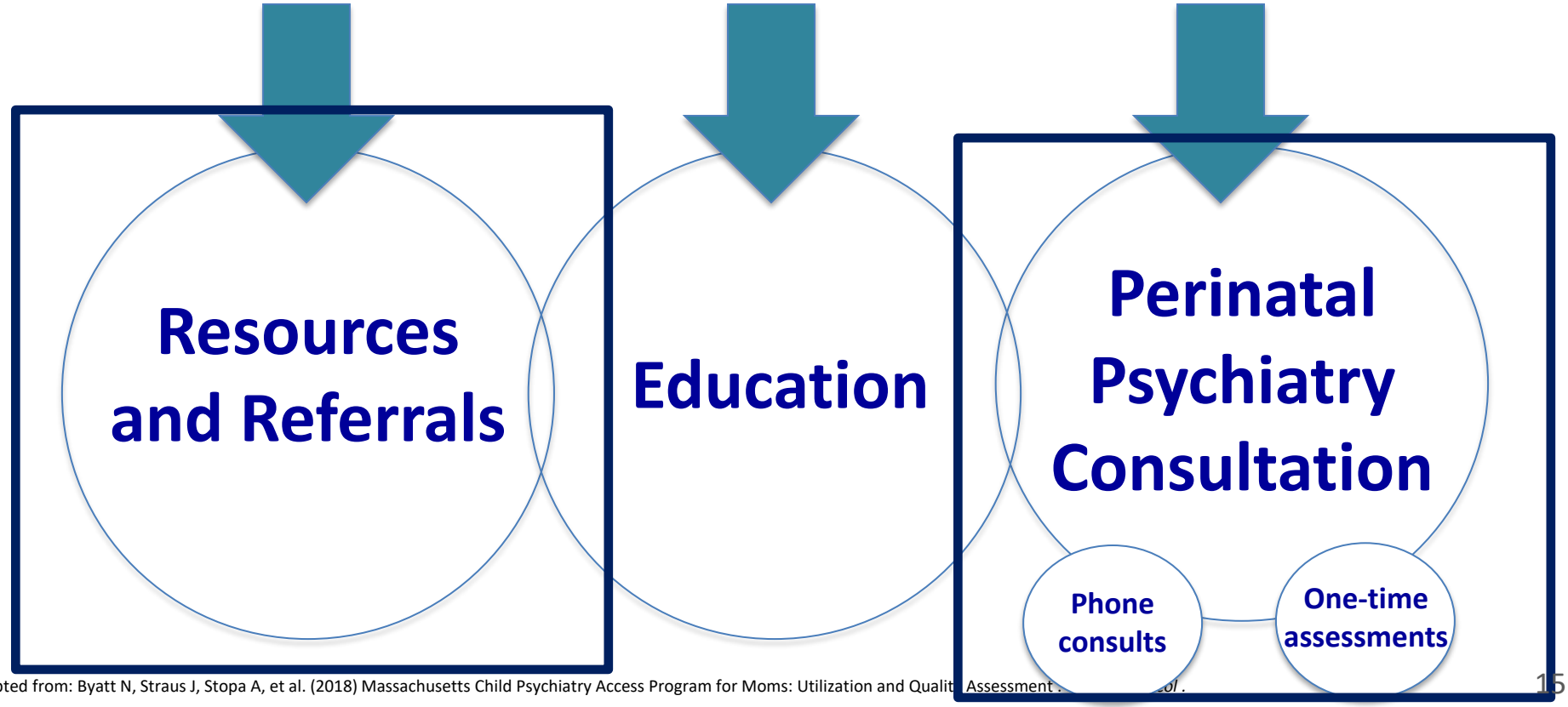
Longitudinal negative binomial models were used to examine the association between increased utilization of MCPAP for Moms and provider capacity

- Estimates incidence rate ratios (IRR)

- **Exposure**: utilization of MCPAP for Moms (July 2014 – June 2020)
  - Resource and referral encounters
  - Clinical consultations front-line providers
  - One-time assessments with patients

Massachusetts Child Psychiatry Access Program

MCPAP For Moms



Adapted from: Byatt N, Straus J, Stopa A, et al. (2018) Massachusetts Child Psychiatry Access Program for Moms: Utilization and Quality Assessment . *J* .

Longitudinal analyses of MCPAP for Moms encounter data

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- Estimates incidence rate ratios (IRR)

- **Exposure**: utilization of MCPAP for Moms (July 2014 – June 2020)
  - Resource and referral encounters
  - Clinical consultations front-line providers
  - One-time assessments with patients

- **Outcomes**: Increasing rate and complexity of the patients a provider directly treats
  - Treatment overall
  - Treatment of unipolar depression *(not increased complexity)*
  - Treatment of bipolar disorder *(increased complexity)*

Exploratory **group-based trajectory models** were used to determine if sub-groups of provider utilization patterns existed and associated outcomes.

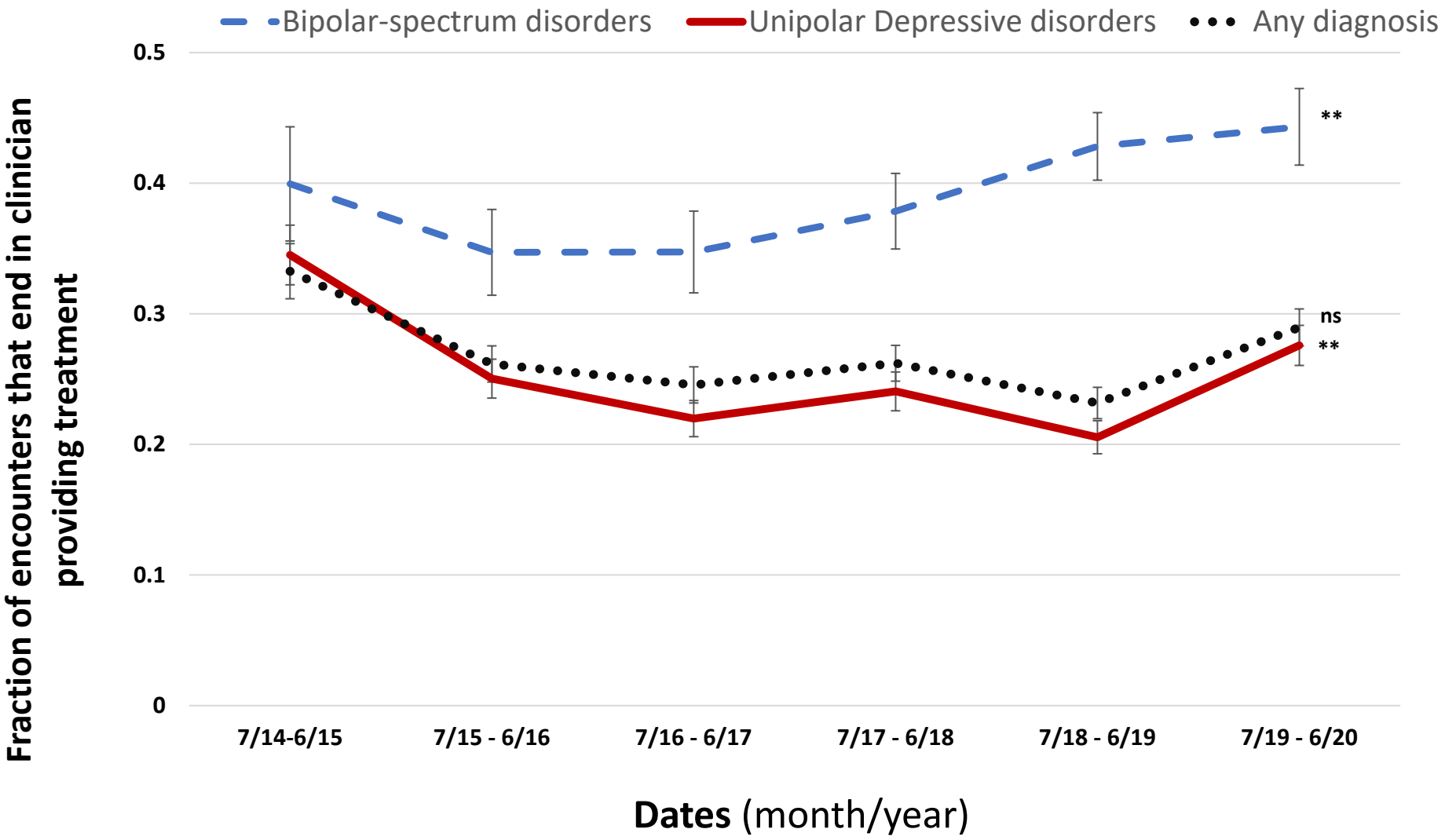
Providers that utilized MCPAP for Moms

(n = 1,006)

Physician	59.9%
Midwife	20.4%
Nurse Practitioner/ Physician Assistant	18.5%
Other	1.2%

Masters GA, Yuan Y, Li N, et al. Improving front-line clinician capacity to address bipolar disorder among perinatal individuals: a longitudinal analysis of the Massachusetts Child Psychiatry Access Program (MCPAP) for Moms. *Under Review.*

Clinicians are increasingly providing direct mental health treatment to patients with BD after encounters



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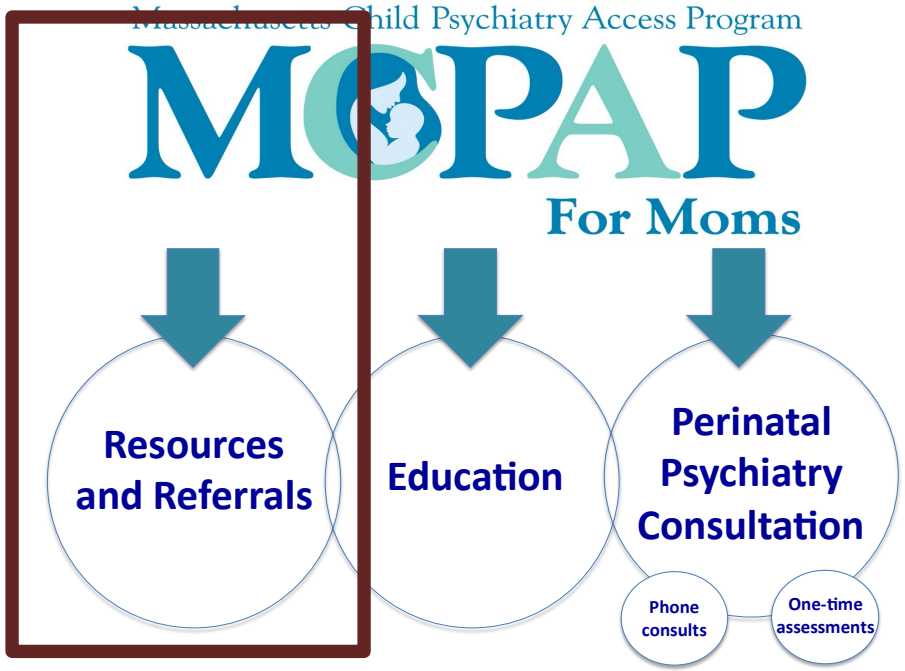
**p<0.01 based on trend, error bars represent standard error
Analysis includes prescribers only (physicians, NPs, PAs)

Increased utilization of R&R encounters was modestly associated with the rates at which clinicians provided direct mental healthcare for any diagnosis

Utilization of R&R services



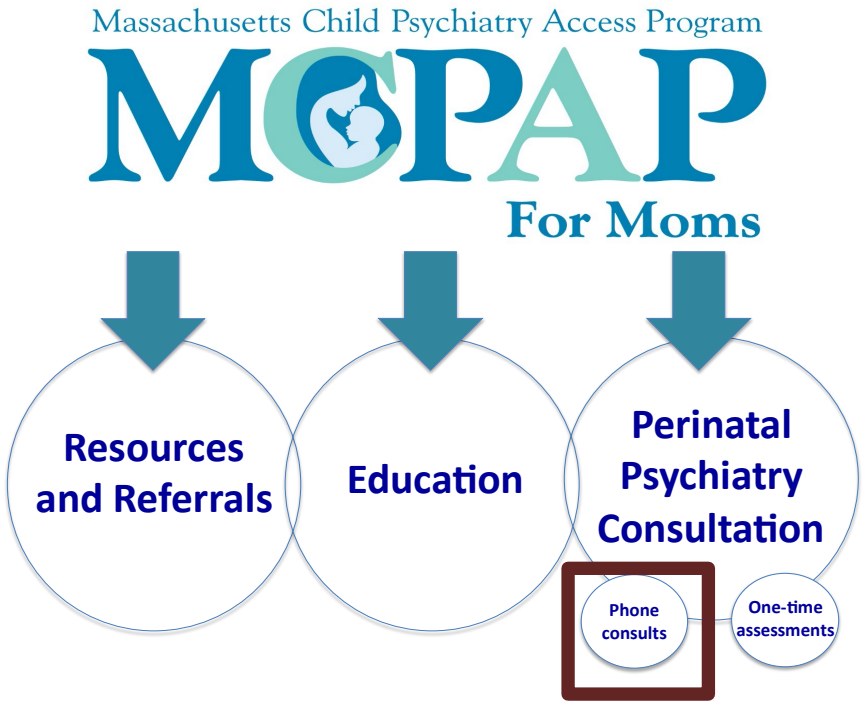
	Any diagnosis		Unipolar depressive disorders		Bipolar-spectrum disorders	
	IRR	*95% CI*	*IRR*	*95% CI*	*IRR*	*95% CI*
Utilization of R&R	**1.05**	**1.04 to 1.06**	**1.06**	**1.05 to 1.07**	**1.07**	**1.05 to 1.09**

Masters GA, Yuan Y, Li N, et al. Improving front-line clinician capacity to address bipolar disorder among perinatal individuals: a longitudinal analysis of the Massachusetts Child Psychiatry Access Program (MCPAP) for Moms. *Under Review.*

Also controlling for time elapsed and rural community
IRR = Incidence Rate Ratio, derived from longitudinal negative binomial regressions
Analysis includes prescribers only (physicians, NPs, PAs)

Increased utilization of phone consults was significantly associated with the rates at which clinicians provided direct mental healthcare for any diagnosis

Utilization of phone consultations



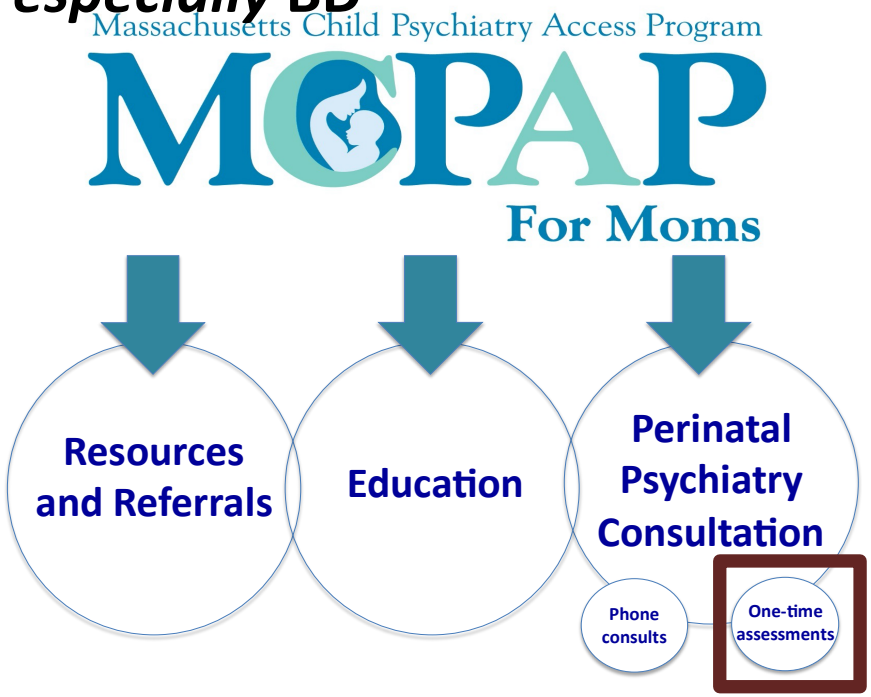
	Any diagnosis		Unipolar depressive disorders		Bipolar-spectrum disorders	
	IRR	*95% CI*	*IRR*	*95% CI*	*IRR*	*95% CI*
Utilization of phone consults	**1.30**	**1.28 to 1.33**	**1.31**	**1.28 to 1.34**	**1.25**	**1.20 to 1.29**

Masters GA, Yuan Y, Li N, et al. Improving front-line clinician capacity to address bipolar disorder among perinatal individuals: a longitudinal analysis of the Massachusetts Child Psychiatry Access Program (MCPAP) for Moms. *Under Review.*

Also controlling for time elapsed and rural community
IRR = Incidence Rate Ratio, derived from longitudinal negative binomial regressions
Analysis includes prescribers only (physicians, NPs, PAs)

Increased utilization of one-time assessments was significantly associated with the highest rates at which clinicians provided direct mental healthcare for any diagnosis, *especially* BD

Utilization of one-time assessments



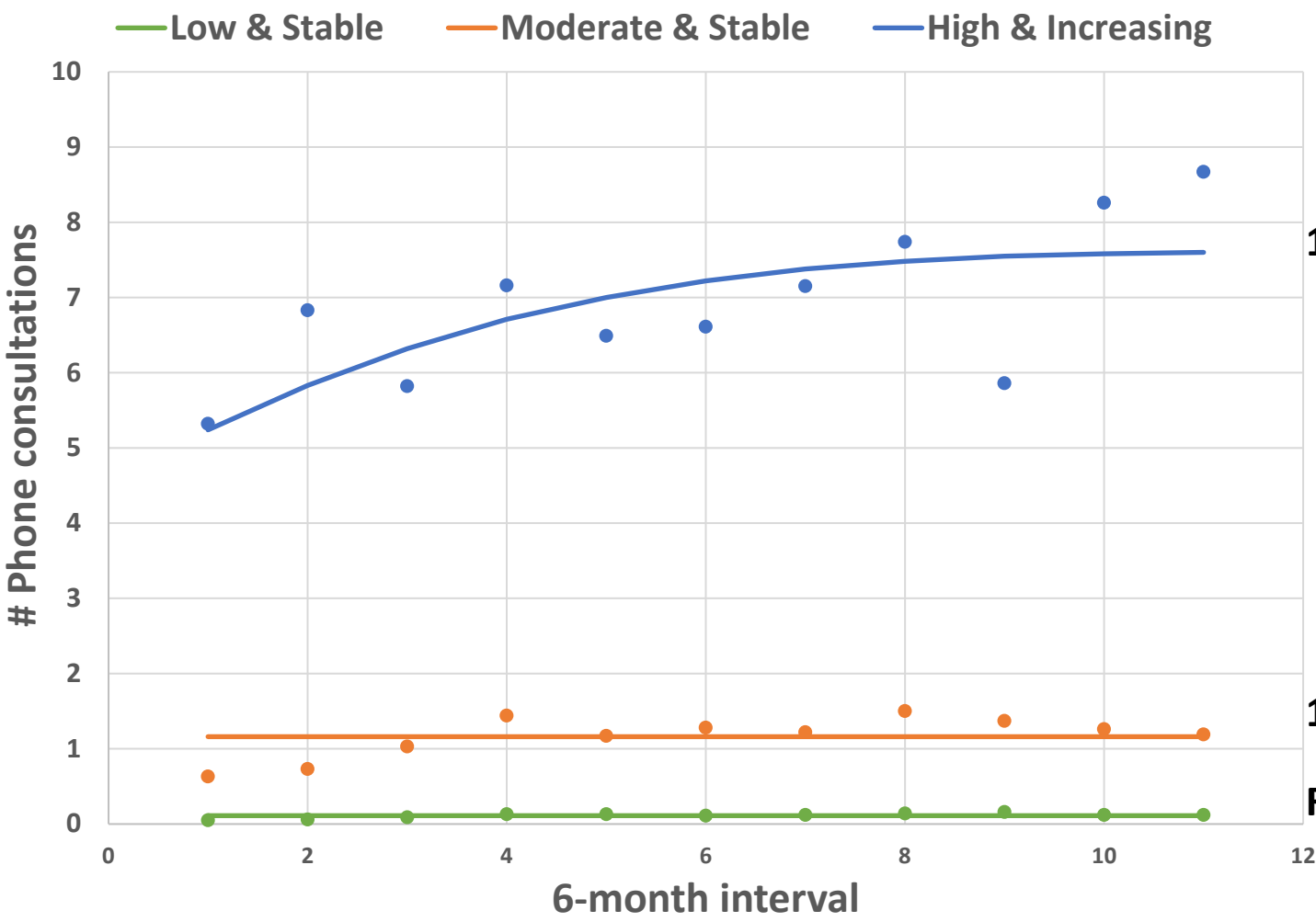
	Any diagnosis		Unipolar depressive disorders		Bipolar-spectrum disorders	
	IRR	*95% CI*	*IRR*	*95% CI*	*IRR*	*95% CI*
Utilization of one-time consults	**1.70**	**1.60 to 1.81**	**1.66**	**1.53 to 1.79**	**2.12**	**1.86 to 2.41**

Masters GA, Yuan Y, Li N, et al. Improving front-line clinician capacity to address bipolar disorder among perinatal individuals: a longitudinal analysis of the Massachusetts Child Psychiatry Access Program (MCPAP) for Moms. *Under Review.*

Also controlling for time elapsed and rural community
IRR = Incidence Rate Ratio, derived from longitudinal negative binomial regressions
Analysis includes prescribers only (physicians, NPs, PAs)

Provider sub-group utilization

IRR [95% CI] of group, for providers treating BD



13.5 [4.2 – 43.2]

1.8 [1.3 – 2.6]

Reference

Masters GA, Yuan Y, Li N, et al. Improving front-line clinician capacity to address bipolar disorder among perinatal individuals: a longitudinal analysis of the Massachusetts Child Psychiatry Access Program (MCPAP) for Moms. *Under Review.*

Utilization of MCPAP for Moms is associated with clinicians providing more direct mental health care to their patients, including those with complex illnesses like BD

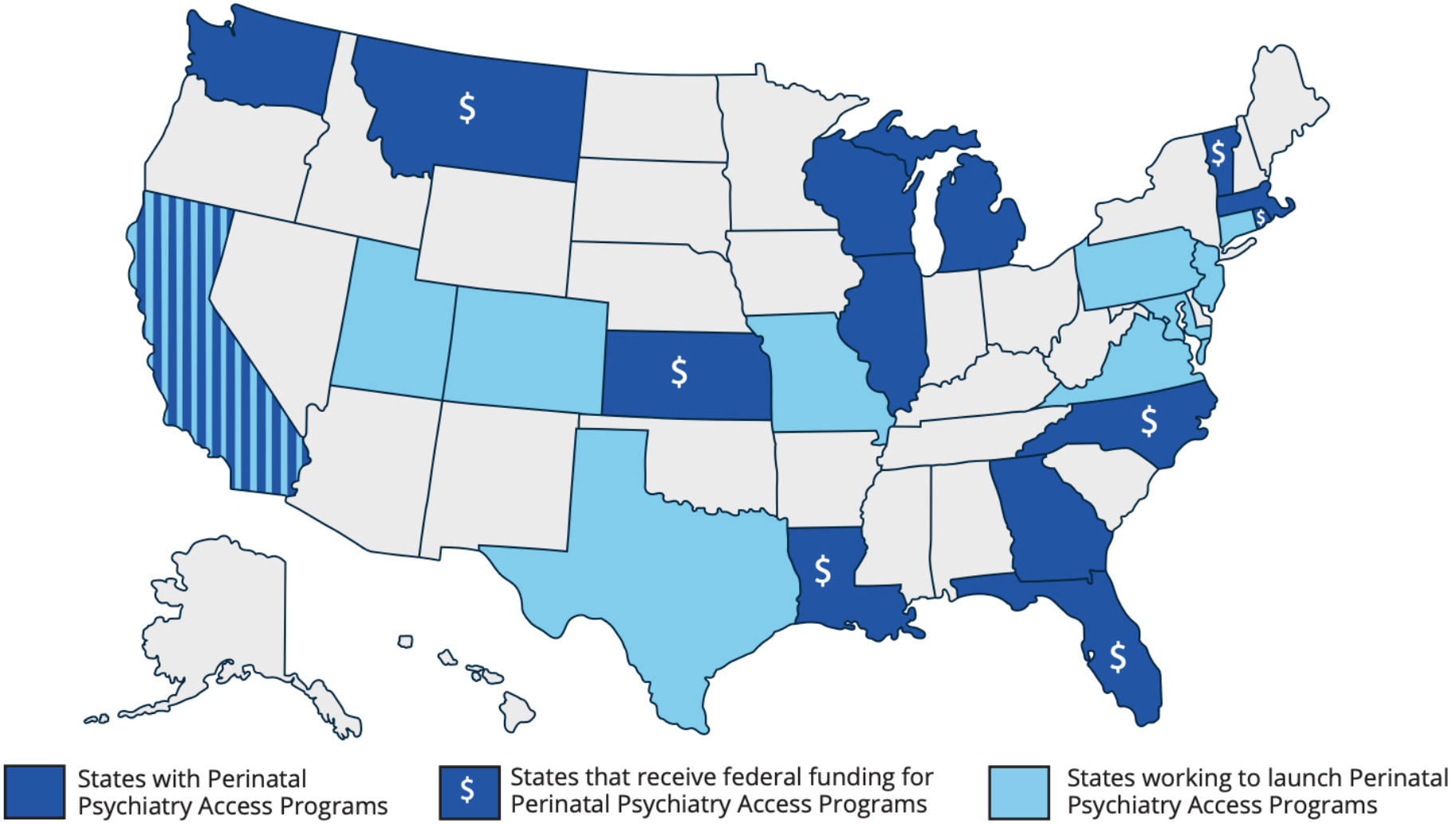
- One-time assessments may be the most capacity building

- Sub-groups and associated utilization may influence the degree to which utilization affects provider capacity

Implications of this work

- Evidence for the Access Program model to help clinicians care for patients with BD
    - Clinicians are willing to address BD with support
    - Utilization and association with changes in provider capacity may depend on the types of services used
    - Rural communities are especially benefited
    - Important point for emerging programs to consider

May inform ongoing development & refinement of other Access Programs



Byatt N, Bergman AL, Maslin M et al. (2020) Addressing perinatal mental health by building medical provider capacity through perinatal psychiatry access programs. *Psychiatry Issue Brief.*

Strengths of this work

- Contributions to an understudied area and population

- Mixed methods yields rich quantitative and qualitative data

- Early evidence for the Access Program model in time for other programs to build upon

Limitations of this work

- Limited studies with which to estimate rates of BD and mood episodes
- Perspectives of participants were racially and ethnically homogenous
- Analyses stem from one Access Program
- Formal link to patient outcomes is still unclear

Future directions

- Research should make a concerted effort to include bipolar disorder

- Emphasis on health equity and addressing structural determinants affecting access to care

- Examine for associations in other illnesses

- Work to further elucidate the mechanisms by which Access Programs work and best serve patients

Acknowledgments

Lifeline4Moms Team

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Lifeline for moms

UMASS University of Massachusetts Medical School

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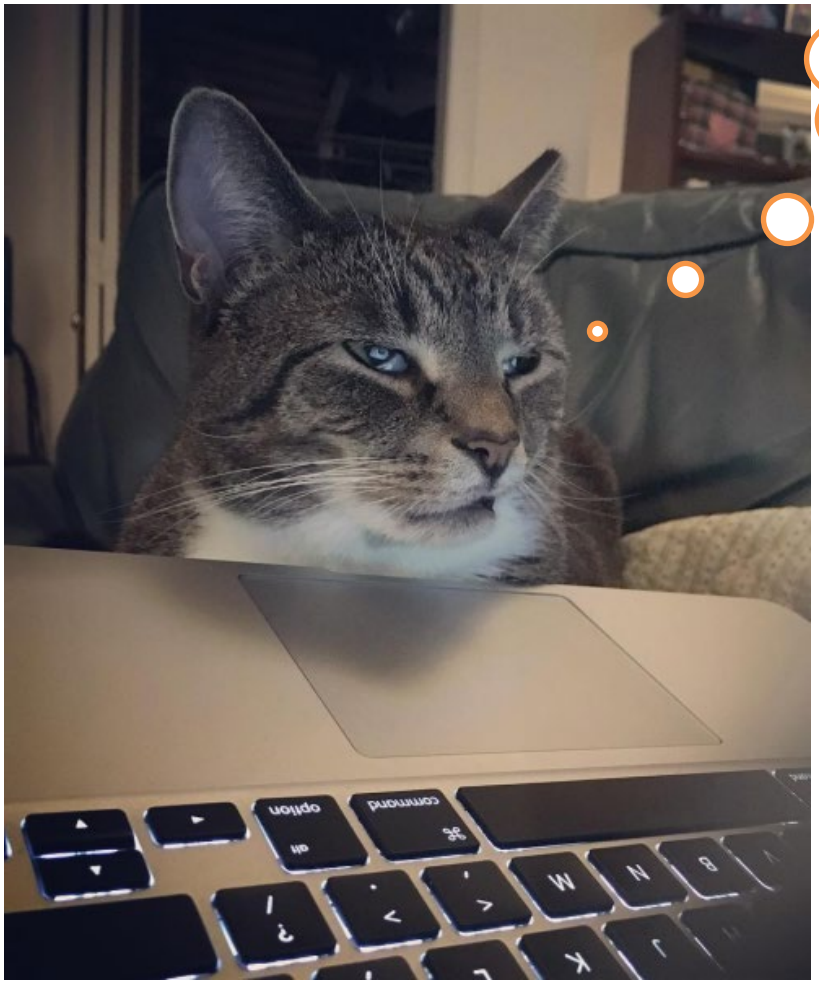
Questions?



Thank you!

Aim 1

Aim 1: Full inclusion/exclusion

Systematic review of databases (PubMed, Scopus, PsycINFO, CINAHL, Cochrane, and ClincalTrials.gov) for studies that estimated rates of BD using validated screening or diagnostic tools

- Inclusion criteria:
  - Original research
  - Published in English
  - Participants were perinatal women (pregnant or within 12-months postpartum) aged 18 or older
  - Study used a validated screening/diagnostic tool to detect BD
    - Examples of validated diagnostic = SCID, MINI, etc
    - Examples of validated screening = MDQ, CIDI

- Exclusion criteria: Studies that were
  - Participants recruited based on a general medical condition
  - 100% of participants with pre-existing BD
  - Study did not report on bipolar disorder related outcomes

Modifications to the Downs & Black Checklist

Item #	Question	Included in this review
Reporting		
1	Is the hypothesis/aim/objective of the study clearly described?	Yes
2	Are the main outcomes to be measured clearly described in the Introduction or Methods section?	Yes
3	Are the characteristics of the patients included in the study clearly described?	Yes
4	Are the interventions of interest clearly described?	Yes
5	Are the distributions of principal confounders in each group of subjects to be compared clearly described?	Yes
6	Are the main findings of the study clearly described?	Yes
7	Does the study provide estimates of the random variability in the data for the main outcomes?	Yes
8	Have all important adverse events that may be a consequence of the intervention been reported?	Yes
9	Have the characteristics of patients lost to follow-up been described?	Yes
10	Have actual probability values been reported (e.g., 0.035 rather than <0.05) for the main outcomes except where the probability value is less than 0.001?	Yes
External validity		
11	Were the subjects asked to participate in the study representative of the entire population from which they were recruited?	No
12	Were those subjects who were prepared to participate representative of the entire population from which they were recruited?	No
13	Were the staff, places, and facilities where the patients were treated, representative of the treatment the majority of patients receive?	No
Internal validity - bias		
14	Was an attempt made to blind study subjects to the intervention they have received?	No
15	Was an attempt made to blind those measuring the main outcomes of the intervention?	No
16	If any of the results of the study were based on “data dredging”, was this made clear?	Yes
17	In trials and cohort studies, do the analyses adjust for different lengths of follow-up of patients, or in case-control studies, is the time period between the intervention and outcome the same for cases and controls?	Yes
18	Were the statistical tests used to assess the main outcomes appropriate?	Yes
19	Was compliance with the intervention/s reliable?	Yes
20	Were the main outcome measures used accurate (valid and reliable)?	Yes

Internal validity - bias		
14	Was an attempt made to blind study subjects to the intervention they have received?	No
15	Was an attempt made to blind those measuring the main outcomes of the intervention?	No
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18	Were the statistical tests used to assess the main outcomes appropriate?	Yes
19	Was compliance with the intervention/s reliable?	Yes
20	Were the main outcome measures used accurate (valid and reliable)?	Yes
Internal validity – confounding/selection bias		
21	Were the patients in different intervention groups (trials and cohort studies) or were the cases and controls (case-control studies) recruited from the same population?	Yes
22	Were study subjects in different intervention groups (trials and cohort studies) or were the cases and controls (case-control studies) recruited over the same period of time?	Yes
23	Were study subjects randomised to intervention groups?	No
24	Was the randomised intervention assignment concealed from both patients and health care staff until recruitment was complete and irrevocable?	No
25	Was there adequate adjustment for confounding in the analyses from which the main findings were drawn?	Yes
26	Were losses of patients to follow-up taken into account?	Yes
Power		
27	Did the study have sufficient power to detect a clinically important effect where the probability value for a difference being due to chance is less than 5%?	Yes

Aim 1: Meta-analysis methods

- Used random- over fixed-effects model
  - Intercept in random-effects (variance component) is used to calculate study weights for contribution to pooled prev

$$w_j^* = \frac{1}{se_j^2 + \tau^2}$$

where w_j^* is the random effects weight for the ith study.

  - Γ^2 = intercept from the homogeneity statistic Cochran's Q and other study parameters

Barendregt JJ & Doi SA (2016) Meta-analysis methods. *http://www.epigear.com/index_files/MetaXL%20User%20Guide.pdf*

Meta-analysis of prevalence (based on inverse variance method)

Prevalence (proportion, # cases disease/# population) follows binomial distribution

- So, binomial equation for variance (expressed as a proportion) can be used to obtain the **individual study weights** (based on IV method)

$$\mathrm{Var}(p) = \frac{p(1-p)}{N}$$

p = prev proportion, N = pop size

- The **pooled prevalence estimate (P), SE, and CIs** then become (according to the inverse variance method):

$$P = \frac{\sum_i \frac{p_i}{\mathrm{Var}(p_i)}}{\sum_i \frac{1}{\mathrm{Var}(p_i)}} \qquad \mathrm{SE}(P) = \sqrt{\sum_i \frac{1}{\mathrm{Var}(p_i)}} \qquad \mathrm{CI}_\gamma(P) = P \pm Z_{\alpha/2}\mathrm{SE}(P)$$

- For studies with prev > 0.5, should do meta-analysis after transforming prevalence to variable that is not constrained to 0-1 and has ~ N distribution
  - Meta-analysis then done on transformed proportions, where inverse of the variance of the transformed proportion is study weight (double arcsine transformation to help with variance instability)

$$t = \sin^{-1}\sqrt{\frac{n}{N+1}} + \sin^{-1}\sqrt{\frac{n+1}{N+1}} \qquad \mathrm{Var}(t) = \frac{1}{N+0.5}$$

n = # ppl in category, t = variance

  - transformed back to proportion for presentation

$$p = 0.5\left\{1 - \mathrm{sgn}(\cos t)\left[1 - \left(\sin t + \frac{\left(\sin t - \frac{1}{\sin t}\right)}{N}\right)^2\right]^{0.5}\right\}$$

$$\mathrm{LLC} = \begin{cases} 0 & \text{if } \frac{\bar{P}}{\bar{v}} < 2 \\ 0.5\left\{1 - \mathrm{sgn}(\cos \bar{t})\left[1 - \left(\sin \bar{t} + \frac{\left(\sin \bar{t} - \frac{1}{\sin \bar{t}}\right)}{\frac{1}{\bar{v}}}\right)^2\right]^{0.5}\right\} \end{cases}$$

$$\mathrm{ULC} = \begin{cases} 1 & \text{if } \left(\frac{1-\bar{P}}{\bar{v}}\right) < 2 \\ 0.5\left\{1 - \mathrm{sgn}(\cos \bar{t})\left[1 - \left(\sin \bar{t} + \frac{\left(\sin \bar{t} - \frac{1}{\sin \bar{t}}\right)}{\frac{1}{\bar{v}}}\right)^2\right]^{0.5}\right\} \end{cases}$$

sgn = sign operator

Barendregt JJ, Doi SA, Lee YY et al. (2013) Meta-analysis of prevalence. *J Epidemiol Community Health.*

Table 2.1a – Prevalence of bipolar disorder and bipolar-spectrum mood episodes in the perinatal period

Table 1a presents prevalence of BD and bipolar-spectrum mood episodes by study in this review. Perinatal status indicates when the sampling was done - during pregnancy only, postpartum only, or both. Population describes the group of women in the denominator of the reported rates; all indicates that there were no pertinent exclusion criteria and the sample ostensibly represents the "general" perinatal population; MDQ+ is reporting rates for the subset of the sample that had a positive MDQ (thus have probably BD); BD only is reporting rates only in women with BD preceding the perinatal period. Rates or rate ranges are reported for both prevalence of BD and by mood episode type. Finally, notes elaborate more on the specifics of how rate measurements were conducted.

Article identifier	Perinatal status		Population	Overall rates of bipolar disorder	Rates of mood episodes that occur in the perinatal period			Notes
	Pregnant	Postpartum			Manic	Depressive	Mixed	
Celik (2016)[111]		X	All	4.8 – 17.5%	No rates, see notes for scores	22.2 – 42.9%	n/a	To measure overall rates: MDQ original scoring (7+2) method[d] used (4.8%) and alternate MDQ scoring (7+ only)[e] used (17.5%) To measure current symptoms: mHCL-32 used to measure manic symptoms (27.0% had 13+ symptoms *but validated criteria is higher; therefore does meet criteria for potential manic/hypomanic episode*); EPDS used to measure depressive symptoms (42.9% positive); BDS used to measure depressive symptoms (22.2% positive)
Clark (2015)[92]		X	All	3.3%	n/a	11.1%	n/a	To measure overall rates: MDQ original scoring (7+2) method[d] used (3.3%) in all participants; of those that screened positive on EPDS and/or MDQ, SCID was done (37.0%) To measure current symptoms: EPDS used to measure depressive symptoms (11.0% positive in all participants, 66.7% in those MDQ+; 91.2% in those with BD per SCID)
			MDQ+	100%[b]	n/a	66.7%	n/a	
Driscoll (2017)[106]	X	X	BD only	100%[a]	No rates, see notes for scores	No rates, see notes for scores	n/a	To measure overall rates: SCID used (100%) To measure current symptoms: Symptom scales were used to measure differences between women who continued or discontinued psychiatric meds in pregnancy/pp. SIGH-ADS and HAM-D used to measured depression at points in pregnancy – the mean scores were similar across groups and of mild/moderate severity; SIGH-ADS and HAM-D scores tended to be lower pp for all groups. MRS used to measure mania – similar, low scores across all groups in pregnancy and postpartum
Dudek (2014)[93]		X	All	3.8-25.5%	n/a	16.0%	n/a	To measure overall rates: MDQ original scoring (7+2) method[d] used (3.8%), alternate MDQ scoring (7+ only)[e] used (25.5%), and alternate MDQ scoring (8+ only)[f] used (15.1%) To measure current symptoms: EPDS used to measure depressive symptoms (16.0% positive in all, 65.6% positive in MDQ+ using 7+ only scoring, 72.1% positive in MDQ+ using 8+ only scoring)
			MDQ+	100%[b]	n/a	65.6 – 72.1%	n/a	
Giardinelli (2012)[94]	X		All	1.5%	n/a	21.9%	n/a	To measure overall rates: SCID used (1.5%) To measure current symptoms: EPDS used to measure depressive symptoms in pregnancy and postpartum, but neither rates, scores, nor associations with bipolar disorder reported; in pregnancy, overall 12% scored 10-12, 10%> 13; postpartum: 7.6% scored 10-12, 5.6% > 13
		X			n/a	13.2%	n/a	
Jaeschke (2017)[95]		X	All	4.6 – 23.7%	n/a	15.2%	n/a	To measure overall rates: MDQ original scoring (7+2) method[d] used (4.6%) and alternate MDQ scoring (7+ only)[e] used (23.7%) To measure current symptoms: EPDS used to measure depressive symptoms (15.2% positive overall; 24.3% positive in those MDQ positive; 12.4% in those MDQ negative)
			MDQ+	100%[b]	n/a	24.3%	n/a	
Kim (2006)[96]	X		All	3.9%	n/a	22.1%	n/a	To measure overall rates: MDQ original scoring (7+2) method[d] used (3.9%) To measure current symptoms: PRIME-MD PHQ used to measure depressive symptoms (14.3% screened positive for minor depression, 7.8% for major depression)
Kimmel (2015)[107]	X	X	BD/MDD	32.3%[a]	n/a	16.2 – 44.0%	n/a	To measure overall rates: SCID used (32.3%) To measure current symptoms: SCID used to measure current depressive symptoms (30.8% developed postpartum depression in BD; 44.0% developed postpartum depression in MDD, 39.5% overall); Overall: 25% remained well all through perinatal period; 25% depressed in pregnancy but recovered and were well postpartum; 33.9% were depressed all perinatal period; 16.2% were well in pregnancy but developed PPD
		X	BD	100%	n/a	30.8%	n/a	
Kumar (2016)[97]		X	All	0%	n/a	27.0%	n/a	To measure overall rates: MINI used (0%) To measure current symptoms: MINI used to diagnose depressive symptoms (27.0% with depressive disorder NOS)
Masters (2019)[98]	X	X	All	8.7-18.8%	n/a	22.5%	n/a	To measure overall rates: MDQ original scoring (7+2) method[d] used (8.7%) and alternate MDQ scoring (7+ only)[e] used (18.8%) To measure current symptoms: EPDS used to measure depressive symptoms (22.5% positive overall; 55.6% positive in those MDQ positive)
			MDQ+	100%[b]	n/a	55.6%	n/a	

Table 2.1a – Prevalence of bipolar disorder and bipolar-spectrum mood episodes in the perinatal period

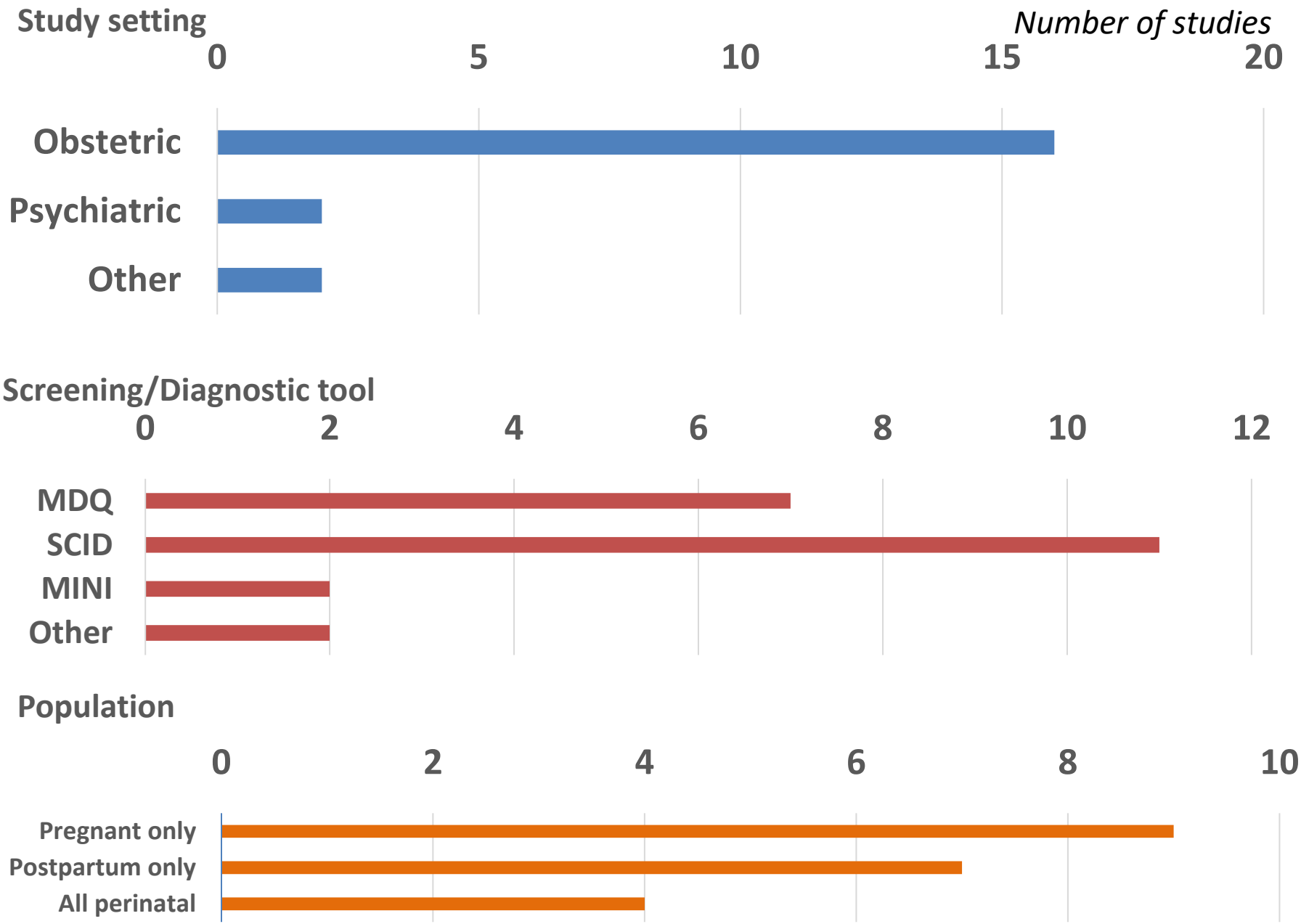
Table 1a presents prevalence of BD and bipolar-spectrum mood episodes by study in this review. Perinatal status indicates when the sampling was done - during pregnancy only, postpartum only, or both. Population describes the group of women in the denominator of the reported rates; all indicates that there were no pertinent exclusion criteria and the sample ostensibly represents the "general" perinatal population; MDQ+ is reporting rates for the subset of the sample that had a positive MDQ (thus have probably BD); BD only is reporting rates only in women with BD preceding the perinatal period. Rates or rate ranges are reported for both prevalence of BD and by mood episode type. Finally, notes elaborate more on the specifics of how rate measurements were conducted.

Article identifier	Perinatal status		Population	Overall rates of bipolar disorder	Rates of mood episodes that occur in the perinatal period			Notes
	Pregnant	Postpartum			Manic	Depressive	Mixed	
Pingo (2017)[99]		X	All	0%	31.6%	15.8-45.6%	17.5%	To measure overall rates: SCID used (0%) To measure current symptoms: Highs scale used to measure hypomanic symptoms at 3 days pp (31.6%); EPDS used to measure depressive symptoms at 3 days pp (15.8% positive) and 6 weeks pp (45.6%); 17.5% positive on highs and EPDS both at 3 days pp
Pope (2013)[100]	X	X	MDD/BDII	36.1%[a]	No rates, see notes for scores	n/a	n/a	To measure overall rates: SCID used (36.1%) To measure current symptoms: YMRS used to measure hypomanic symptoms (40.8% score > 3, *but validated criteria cutoff is higher; therefore does meet criteria for potential manic/hypomanic episode*)
Robakis (2015)[101]	X	X	Combined	8.2%[a,c]	n/a	No rates, see notes for scores	n/a	To measure overall rates: SCID used (8.2%) To measure current symptoms: EPDS was used to measure depressive symptoms: mean postnatal EPDS scores were 5.81 for women with no mood disorder history, 6.86 for women with history of unipolar depression, and 12.25 for women with history of bipolar disorder respectively
Sharma (2011)[102]		X	MDD/BD	45.6 - 48.0%[a]	n/a	n/a	n/a	To measure overall rates: MDQ original scoring (7+2) method[d] used (45.6%) and alternate MDQ scoring (8+ only)[e] used (48.0%); SCID used (45.6%)
Sharma (2013)[103]	X		BDII	100%[a]	8.1%	43.2%	n/a	To measure overall rates: SCID used (100%) To measure current symptoms: SCID used to measure hypomanic and depressive episodes; 51% had a mood episode while pregnant; 70.3% had a mood episode postpartum; 8.11% had 1+ hypomanic episodes in pregnancy and 43.24% had 1+ depressive episodes in pregnancy; 27.03% had 1+ hypomanic episodes in pregnancy and 43.24% and 1+ depressive episodes in pregnancy
		X			27.0%	43.2%	n/a	
Sharma (2014)[108]	X		MDD/BDII	37.0%	n/a	n/a	n/a	To measure overall rates: SCID used at start (37.0%) and MINI at end (41.1%) to see conversion rate to BD
		X		41.1%	n/a	n/a	n/a	
Sit (2014)[104]	X		Combined	26.0%[a,c]	n/a	n/a	n/a	To measure overall rates: SCID used (26.0%)
Sole (2019)[109]	X		Combined	50.0%[a,c]	n/a	n/a	n/a	To measure lifetime rates: SCID used (50.0%)
Uguz (2019)[105]		X	All	0.2%	n/a	n/a	n/a	To measure overall rates: SCID used (0.2%)
Vesga-López (2008)[50]	X	X	All	2.9%	n/a	n/a	n/a	To measure overall rates: AUDADIS-IV used (2.9%)
Wisner (2004)[110]	X		BD	100%	n/a	n/a	n/a	To measure overall rates: SCID used (100%) To measure current symptoms: episodes compared between medicated (VLP) and non-medicated groups; hypomanic/manic episode postpartum (6.7% in VLP vs 9.1% in non-med); mixed episode pp (6.7% in VLP vs 18.2% in non-med); depressive episode pp (53.3% in VLP vs 45.5% non-med); any episode pp (66.7% in VLP vs 72.7% non-med)
		X		100%[a]	7.7%	50.0%	11.5%	
Wisner (2013)[35]		X	All	n/a	n/a	14.0%	n/a	To measure overall rates: SCID used (22.6% in those with postpartum depression) To measure current symptoms: EPDS used (14.0% overall, 100% in those with postpartum depression); higher EPDS cut points more predictive of BD than MDD or others
			PPD	22.6%	n/a	100% See notes for association	n/a	

SUPPLMENTAL TABLE S2.3– Summary of studies included in the systematic review

Article identifier	Location, time frame, & study design	Objective	Study sample	Downs & Black quality rating
Celik (2016) [111]	**Location:** Batman, Turkey **Setting:** Family medicine practice **Time period:** February 2016 **Study design:** Cross-sectional	To screen for postpartum depression and bipolar disorder and determine proportion of bipolarity and mixed depression	**Sample size:** 63 **Age, years (mean, SD):** 30.1 (5.2) **Study participants:** Postpartum women **Pertinent inclusion criteria:** none	76.9%
Clark (2015) [92]	**Location:** Pittsburgh, PA, USA **Setting:** Labor & delivery unit **Time period:** Oct 2011 – March 2012 **Study design:** Cross-sectional	To use the MDQ & EPDS to identify depression and history of hypomania/mania in postpartum women	**Sample size:** 1,279 **Age:** differed by group **Study participants:** Postpartum women **Pertinent inclusion criteria:** none	85.7%
Driscoll (2017) [106]	**Location:** Pittsburgh, PA, USA **Setting:** Specialized women's mental health center **Time period :** July 2006 – March 2011 **Study design:** Prospective	To explore course of bipolar disorder and impact of pharmacotherapy on symptoms, characterize depression and mania in perinatal period, and compare symptom levels of treated women to untreated women	**Sample size:** 159 **Age, years (mean, SD):** 26.3 (6.2) **Study participants:** Pregnant and postpartum women **Pertinent inclusion criteria:** Bipolar disorder diagnosis	85.7%
Dudek (2014) [93]	**Location:** Krakow & Tarnow, Poland **Setting:** Obstetric clinic **Time period:** February 2010 - April 2012 **Study design:** Cross-sectional	To investigate whether presumed postpartum depression with bipolar features differs from the unipolar postpartum depression	**Sample size:** 344 **Age, years (mean, SD):** 30.2 (4.3) **Study participants:** Postpartum women **Pertinent inclusion criteria:** No prior history of psychiatric illness or treatment	73.3%
Giardinelli (2012) [94]	**Location:** Florence, Italy **Setting:** Obstetric clinic **Time period:** April 2007 - April 2008 **Study design:** Prospective	To analyze prevalence of anxiety and mood disorders, risk factors, and sociodemographic features in perinatal women	**Sample size:** 590 **Age, years (mean, SD):** 34.3 (4.2) **Study participants:** Pregnant and postpartum women **Pertinent inclusion criteria:** none	64.3%
Jaeschke (2017) [95]	**Location:** Krakow & Tarnow, Poland **Setting:** Labor & delivery units **Time period:** Nov 2009 – Feb 2013 **Study design:** Cross-sectional	To analyze the prevalence, correlation, and associated characteristics of bipolar symptoms in women with or without postpartum depression	**Sample size:** 434 **Age, years (mean, SD):** 30.2 (4.3) **Study participants:** Postpartum women **Pertinent inclusion criteria:** No prior history of psychiatric illness	76.9%
Kim (2006) [96]	**Location:** Minneapolis, MN, USA **Setting:** Obstetric clinic **Time period:** Feb – Oct 2002 **Study design:** Cross-sectional	To assess prevalence of psychiatric illness in Spanish- and English-speaking obstetric patients with lower incomes in and examine associations between diagnoses and prenatal care utilization	**Sample size:** 154 **Age, years (mean, SD):** 25 (5.7) **Study participants:** Pregnant women **Pertinent inclusion criteria:** none	61.5%
Kimmel (2015) [107]	**Location:** Baltimore, MD, USA **Setting:** Mood disorders center **Time period:** not reported **Study design:** Prospective	To associate depression during pregnancy and use of medications, and clinical risk factors for postpartum depression	**Sample size:** 93 **Age, years (mean, SD):** 30.5 (6.2) **Study participants:** Pregnant and postpartum women **Pertinent inclusion criteria:** History of a mood disorder	71.4%
Kumar (2016) [97]	**Location:** Mysore, India **Setting:** Labor & delivery unit **Time period:** Jun – Dec 2011 **Study design:** Cross-sectional	To assess psychiatric morbidity and correlates in postpartum women	**Sample size:** 152 **Age, years (mean, SD):** 23 (4.8) **Study participants:** Postpartum women **Pertinent inclusion criteria:** none	69.2%
Masters (2019) [98]	**Location:** Multiple cities in MA, USA **Setting:** Obstetric clinics **Time period:** May 2016 – Jun 2018 **Study design:** Cross-sectional	To describe proportion of perinatal women who screen positive for bipolar disorder in the obstetric setting and associations with characteristics and healthcare utilization	**Sample size:** 574 **Age, years (mean, SD):** 31.5 (5.3) **Study participants:** Pregnant and postpartum women **Pertinent inclusion criteria:** none	85.7%

Article identifier	Location, time frame, & study design	Objective	Study sample	Downs & Black quality rating
Pingo (2017) [99]	**Location:** Cape Town, South Africa **Setting:** Obstetric clinic **Time period:** Feb 2005 - July 2010 **Study design:** Prospective	To evaluate frequency and factors associated with probable postpartum hypomania and postpartum depression	**Sample size:** 57 **Age, years (mean, SD):** 25.1 (6.4) **Study participants:** Pregnant and postpartum women **Pertinent inclusion criteria:** none	60.0%
Pope (2013) [100]	**Location**: London, ON, Canada **Setting**: Obstetric clinic **Time period**: Jun 2005 - Mar 2010 **Study design:** Prospective	To explore prevalence of suicidal ideation in perinatal period in women with history of major depression or bipolar disorder II and associated characteristics	**Sample size:** 147 **Age, years (mean, SD):** 29.0 (5.5) **Study participants**: Pregnant and postpartum women **Pertinent inclusion criteria**: Mood disorder diagnosis (MDD or BDII)	71.4%
Robakis (2015) [101]	**Location**: Palo Alto, CA, USA **Setting**: Obstetric clinic **Time period**: Sept 2011 - March 2014 **Study design:** Prospective	To explore relationship between antenatal optimism and depressive symptoms, attitudes toward maternity, and mother-to-infant bonding postnatally	**Sample size:** 98 **Age, years (mean, SD):** 32.2 (4.9) **Study participants**: Pregnant and postpartum women **Pertinent inclusion criteria**: 30% of recruited sample had mood disorder	61.5%
Sharma (2011) [102]	**Location:** London, ON, Canada **Setting:** Perinatal clinic in a psychiatric hospital **Time period:** 2005 – 2009 **Study design:** Cross-sectional	To study performance of the MDQ during the postpartum period among women with bipolar disorder	**Sample size:** 125 **Age, years (mean, SD):** 28 (5.2) **Study participants:** Postpartum women **Pertinent inclusion criteria:** Mood disorder diagnosis (MDD or BD)	61.5%
Sharma (2013) [103]	**Location:** London, ON, Canada **Setting:** Obstetric clinic **Time period:** not reported **Study design:** Prospective	To report on psychotropic drug use in bipolar disorder II in perinatal period risk of recurrence	**Sample size:** 53 **Age, years (mean, SD):** 27.7 (5.4) **Study participants:** Pregnant and postpartum women **Pertinent inclusion criteria:** BDII diagnosis	92.9%
Sharma (2014) [108]	**Location:** London, ON, Canada **Setting:** Perinatal clinic in a psychiatric hospital **Time period:** 2005 – 2009 **Study design:** Prospective	To investigate rate and risk factors for diagnostic conversion from major depression to bipolar disorder & from bipolar disorder II to bipolar disorder I during perinatal period	**Sample size:** 146 **Age:** differed by group **Study participants:** Pregnant and postpartum women **Pertinent inclusion criteria:** Mood disorder diagnosis (MDD or BDII)	57.1%
Sit (2014) [104]	**Location:** Pittsburgh, PA, USA **Setting:** Obstetric hospital (not specified if inpatient or outpatient) **Time period:** not specified **Study design:** Prospective	To investigate relationship between having a maternal mood disorder and adverse pregnancy outcomes	**Sample size:** 192 **Age, years (mean, SD):** 28.7 (6.0) **Study participants:** Pregnant women **Pertinent inclusion criteria:** Diagnosis of MDD, BD, or women without history of psychiatric illness	92.9%
Sole (2019) [109]	**Location:** Barcelona, Spain **Setting:** Perinatal Psychiatry Program **Time period:** Jan 2005 - March 2017 **Study design:** Prospective	To evaluate obstetric outcomes and labor type in pregnant women with bipolar disorder compared with pregnant women without any psychiatric disorder, and possible risk factors associated	**Sample size:** 200 **Age, years (mean, SD):** 34.9 (4.3) **Study participants:** Pregnant women **Pertinent inclusion criteria:** Diagnosis of BD or women without history of psychiatric illness	45.5%
Uguz (2019) [105]	**Location:** Konya, Turkey **Setting:** Labor & Delivery unit **Time period:** not reported **Study design:** Cross-sectional	To compare prevalence of mood and anxiety disorders in pregnant and non-pregnant women	**Sample size:** 1,154 **Age, years (mean, SD):** 28.3 (5.7) **Study participants:** Postpartum women **Pertinent inclusion criteria:** none	66.7%
Vesga-López (2008) [50]	**Location:** USA **Setting:** NESARC survey (civilians by census) **Time period:** 2001-2002 **Study design:** Cross-sectional	To present prevalence of psychiatric disorders among pregnant women and compare these with the prevalence in non-pregnant women, and identify risk factors and treatment-seeking rates	**Sample size:** 1,524 **Age:** differed by group **Study participants:** Pregnant and postpartum women **Pertinent inclusion criteria:** none	85.7%
Wisner (2004) [110]	**Location:** Pennsylvania, USA **Setting:** not reported **Time period:** Aug 1996 - July 2000 **Study design:** Prospective	To see if valproate immediately postpartum in women with bipolar disorder would prevent episodes and how it affects time to recurrence	**Sample size:** 37 **Age:** differed by group **Study participants:** Pregnant and postpartum women **Pertinent inclusion criteria:** Diagnosis of bipolar disorder	71.4%
Wisner (2013) [35]	**Location:** Pittsburgh, PA, USA **Setting:** Obstetric hospital (not specified if inpatient or outpatient) **Time period:** not specified **Study design:** Retrospective	To determine proportion of women with perinatal depression with episode onset postpartum, during pregnancy, or predating pregnancy, to evaluate the rate of self-harm ideation, and define disorders associated with positive screens	**Sample size:** 826 **Age, years (mean, SD):** 28.8 (5.9) **Study participants:** Postpartum women **Pertinent inclusion criteria:** Postpartum depression (via positive EPDS)	84.6%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Psychiatric
Other
Screening/Diagnostic tool
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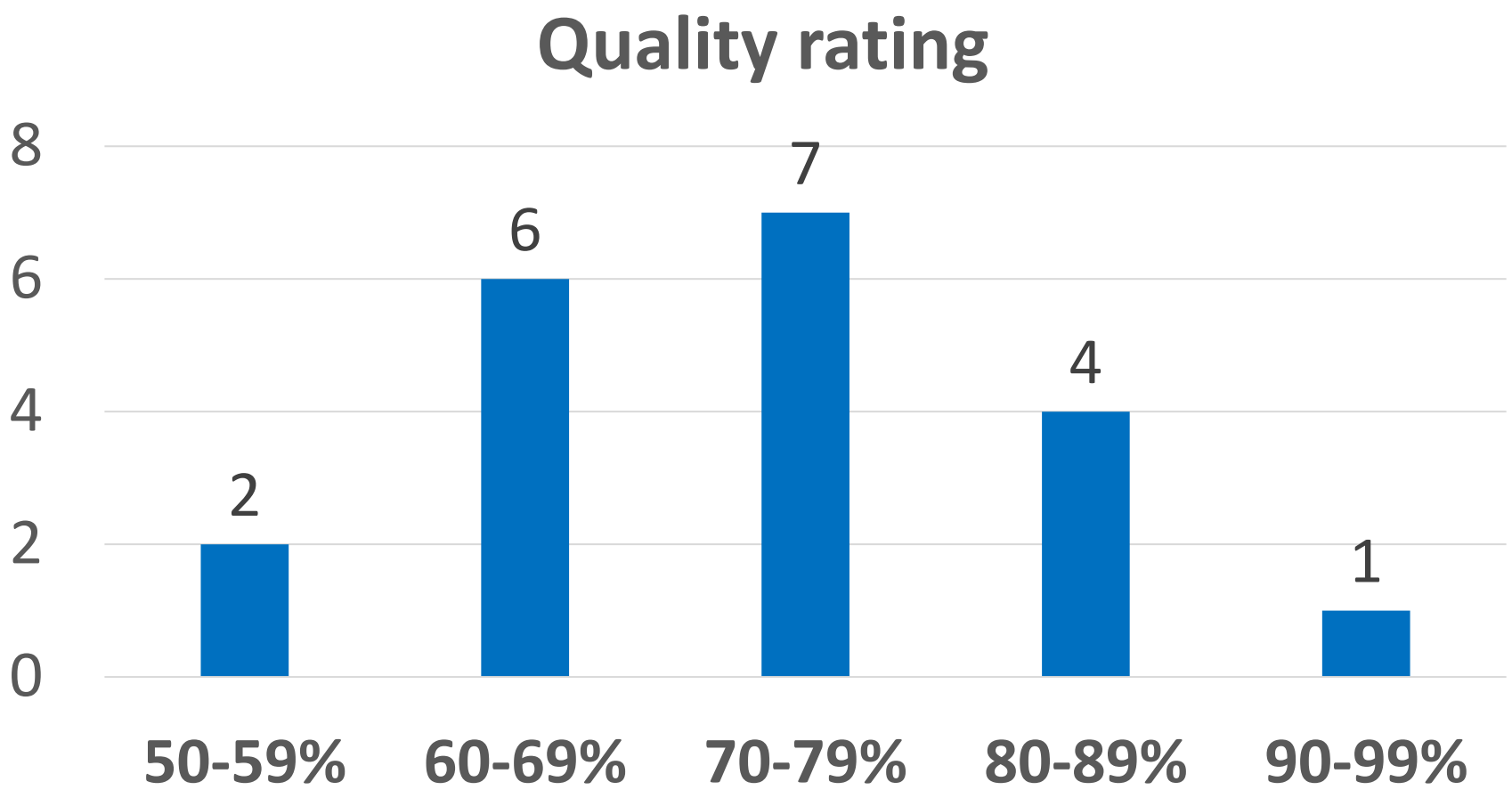
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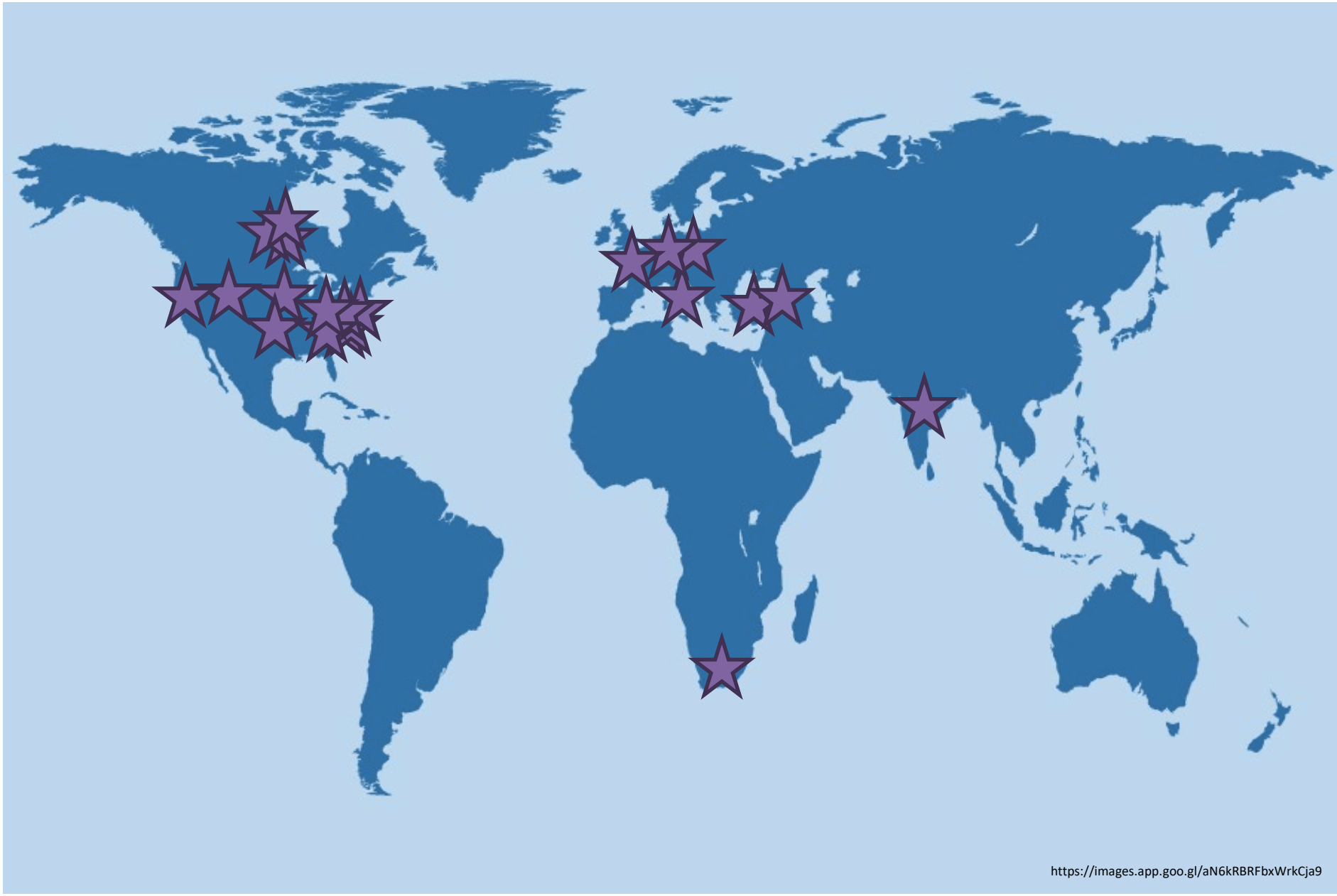
50-59%
60-69%
70-79%
80-89%
90-99%



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Details about estimates

Table 2.1b – Summary of overall prevalence rates of bipolar disorder and bipolar-spectrum mood episode occurrence from included studies, stratified by perinatal stage					
	Prevalence rates		Current episode or symptom occurrence		
	MDQ	Diagnostic	Depressive episodes	Hypomanic/Manic episodes	Mixed episodes
Women without known psychiatric illness preceding the perinatal period					
Pregnant women	**3.3 – 25.6%**	**0.0 – 2.9%**	**21.9 – 22.1%**	**-**	**-**
Postpartum women			**11.1 – 45.6%**	**31.6%**	**17.5%**
All perinatal women			**11.1 – 45.6%**	**31.6%**	**17.5%**
Women with bipolar disorder preceding the perinatal period					
Pregnant women	**100%**	**100%**	**43.2%**	**8.1%**	**-**
Postpartum women			**24.3 – 72.1%**	**7.7 – 27.0%**	**11.5%**
All perinatal women			**24.3 – 72.1%**	**7.7 – 27.0%**	**11.5%**
MDQ = Mood Disorder Questionnaire Diagnostic = includes the Structured Clinical Interview for the DSM-IV; MINI = Mini-International Neuropsychiatric Interview; AUDADIS-IV = Alcohol Use Disorder and Associated Disabilities Interview Schedule-DSM-IV					

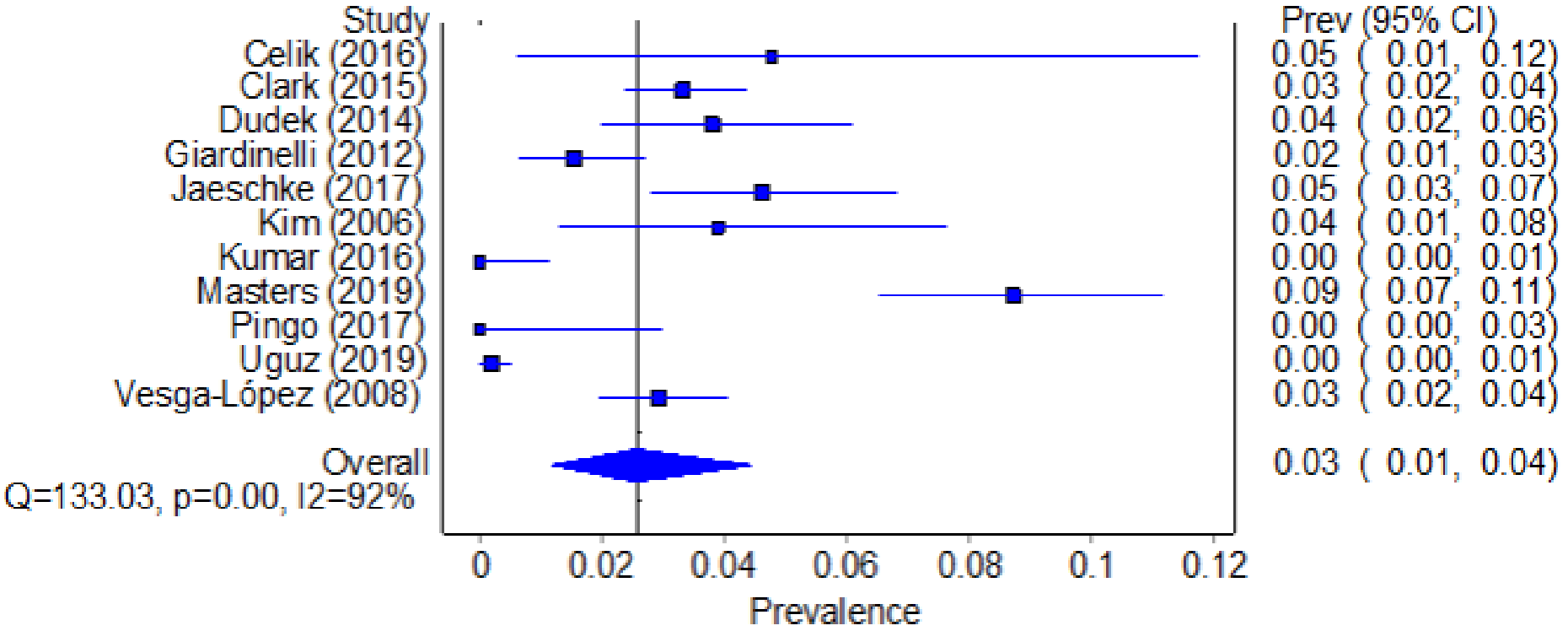
Table 2.2b – Pooled prevalence of any type of bipolar-spectrum mood episode in the perinatal population

Population	**Studies included**	**Pooled prevalence (%)**	**95% CI**	**Heterogeneity index (I^2)**
Women without known psychiatric illness preceding the perinatal period (n = 10)[35,92-99,111]	Episodes in pregnancy (n=2)[94,96]	22.0	19.0 – 25.0	-
	Episodes postpartum (n=8)[35,92-95,97,99,111]	18.0	14.1 – 22.2	-
	Any episodes in perinatal period	**20.1**	**16.0 – 24.5**	**91%**
Women with bipolar disorder preceding the perinatal period (n = 7)[92,93,95,98,103,107,110]	Episodes in pregnancy (n=1)[103]	51.4	-	-
	Episodes postpartum (n=6)[92,93,95,103,107,110]	54.8	34.6 – 74.3	-
	Any episodes in perinatal period	**54.9**	**39.2 – 70.2**	**89%**

Bipolar disorder and history of psychiatric diagnoses were established by screening tool (Mood Disorder Questionnaire) and/or diagnostic interview (Structured Clinical Interview for the DSM-IV, the Mini-International Neuropsychiatric Interview, the Alcohol Use Disorder and Associated Disabilities Interview Schedule-DSM-IV)

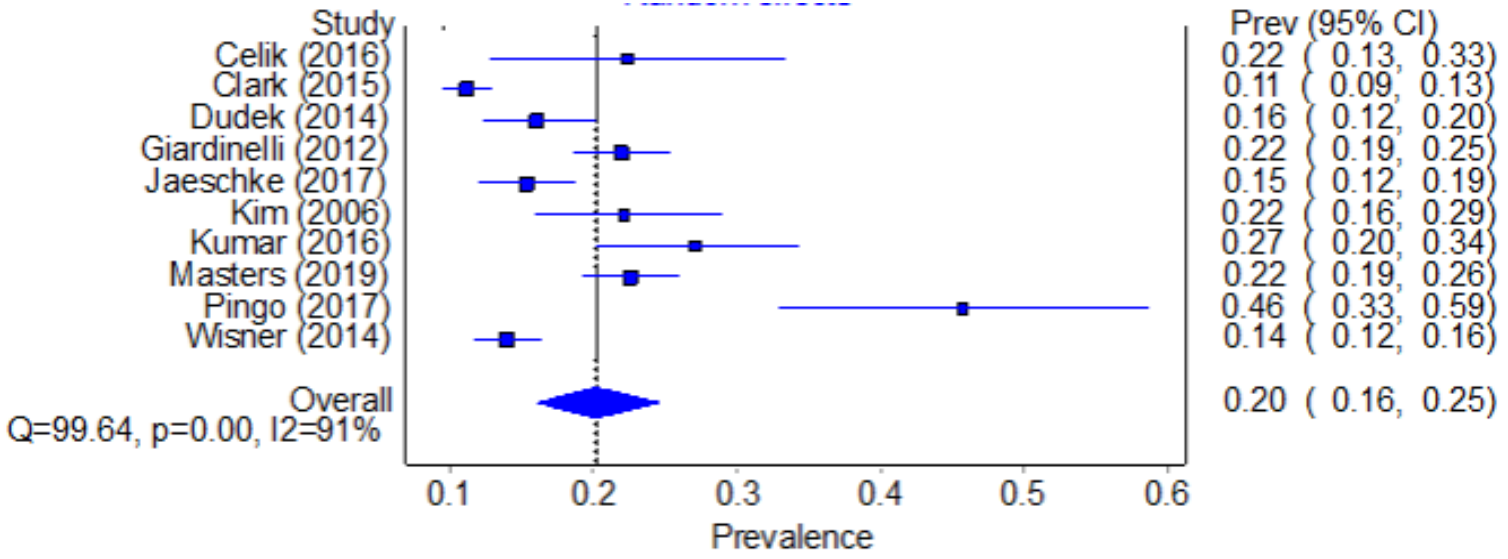
Pooled prevalence of bipolar disorder in perinatal women was 2.6%

Studies included	Pooled prevalence (%)	95% CI	Heterogeneity index (I^2)
All studies using screening tool (n = 6)	4.8	3.1 – 6.9	78%
All studies using diagnostic interview (n = 5)	0.7	0.0 – 2.3	90%
All studies (n=11)	**2.6**	**1.2 – 4.5**	**92%**



Pooled prevalence of BD-spectrum mood episodes in perinatal women WITHOUT a history of psychiatric illness was 20.1%

Studies included	Pooled prevalence (%)	95% CI	Heterogeneity index (I^2)
Episodes in pregnancy (n=2)	22.0	19.0 – 25.0	-
Episodes postpartum (n=8)	18.0	14.1 – 22.2	-
Any time (n = 10)	**20.1**	**16.0 – 24.5**	**91%**

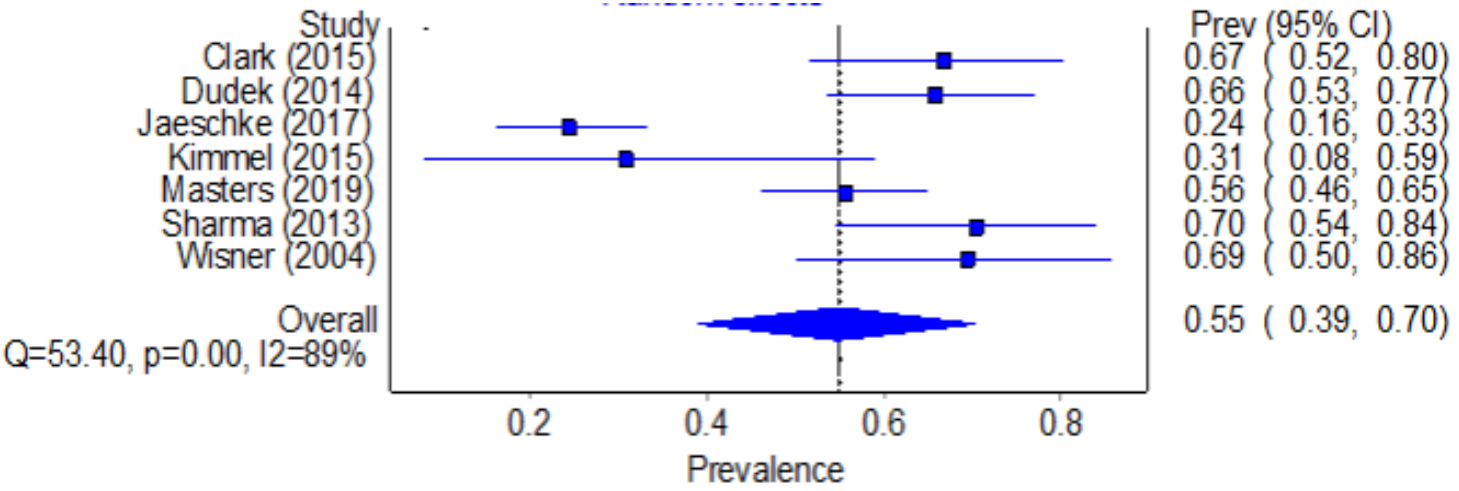


Episode type[1]	
Depressive episodes	Hypomanic/Manic/Mixed episodes
11.1 – 45.6%	**17.5 – 31.6%**

[1]Raw estimates (rather than pooled prevalences from meta-analyses)

Pooled prevalence of BD-spectrum mood episodes in perinatal women WITH a history of psychiatric illness was 54.9%

Studies included	Pooled prevalence (%)	95% CI	Heterogeneity index (I^2)
Episodes in pregnancy (n=1)	51.4	-	-
Episodes postpartum (n=6)	54.8	34.6 – 74.3	-
Any time (n = 7)	**54.9**	**39.2 – 70.2**	**89%**



Episode type[1]	
Depressive episodes	Hypomanic/Manic/Mixed episodes
24.3 – 72.1%	**7.7 – 27.0%**

[1]These are raw estimates (rather than pooled prevalences from meta-analyses) presented to give a sense of the breakdown

Comparing depressive episodes rates in women with and without BD

- Eight studies compared rates of depressive episodes in women with and without BD

- 6/8 studies, **depressive episodes were higher in women with BD** than in those without

- When prevalence rates were compared, **women with BD were 6.5-times as likely to have a depressive episode** than those without probable BD/with unipolar depression

Aim 2

Guideline for the 5 areas of discussion in the focus groups

1) What has been your experience caring for pregnant and postpartum women with bipolar disorder?

1) What is your reaction to the standard of care set forth by ACOG's safety bundle* with regards to screening for bipolar disorder? What challenges have you encountered, or do you anticipate, in implementing screening for bipolar disorder?

1) How do you respond to positive screens for BD or those who report having the disease? If a patient is identified as having or potentially having BD, what do you typically do or what might you consider as the most feasible plan of action?

1) Are you comfortable prescribing any psychotropic medications for bipolar disorder, if necessary?

1) Now knowing the safety bundle recommends to screen for and bipolar disorder and refer for treatment, and what would help you address them? What are your general experiences with and reactions to the MCPAP for Moms program when caring for women with BD or suspected BD? What resources would help you to best address your patients with BD? This can be in addition to, alteration of, or outside of MCPAP for Moms.

Aim 2: Details about qualitative analyses

- Modified grounded theory known as “Coding Consensus, Co-occurrence, and Comparison”
    - Two study investigators (GM, LX) independently reviewed focus group transcripts and generated a preliminary codebook with themes
    - The preliminary codebook, though created inductively using the data itself to identify themes, included a priori domains governed by the study aims, prior work, and relevant literature
    - Preliminary codebooks were discussed by the investigators and agreed upon as a semi-final version, with operational definitions for each code
    - Then, the investigators independently coded all three focus groups based on the semi-final codebook, discussing discrepancies and refining the codebook as necessary after each.
    - Dedoose was used to assist in qualitative analyses. Identified themes were grouped and reported overall as well as by exposure level.
- Goal is to generate theories from data, where theories are plausible relationships among a set of concepts within the data

Mackie T. Qualitative data analysis: an iterative process. *Presentation on 11/20/2020.*

Bipolar disorder and Providers - GROUP CODEBOOK Codes, definitions and illustrative quotes	
Code (child codes indented)	**Definition**
1. Knowledge & current understanding	Comments from providers around their existing/prior knowledge of anything related to bipolar disorder *Examples of prior knowledge, drawn upon for discussion*
a. BD epidemiology, risks, etc.	Comments from providers around their existing knowledge of rates of BD in their patients, the risks of treating or not treating BD, etc.
a. BD treatment, management, etc.	Comments from providers around their existing knowledge of how to treat BD in perinatal women, what drugs to use, risks/rewards of drugs, other therapies, etc.
i. BD relation to MDD and other perinatal mood disorders	Comments from providers around their knowledge of BD as a risk in their patients with specific regard to other PMADs
a. Knowledge - Other	Anything else not covered in the above that references existing knowledge of anything related to bipolar disorder
1. Reaction and attitudes	Comments from providers around their attitudes towards any type of management of bipolar disorder in the perinatal setting
a. Thoughts about **role** in management	Reaction/attitudes to the suggestion that OBs should play a role in treating mental health conditions Thoughts about **role** in management (e.g., what they should or should not be doing)
a. Importance of management/**Valuable** use of time and resources	Reaction/attitudes to relative importance of OBs managing mental health conditions and whether it is a valuable use of their time/resources
a. New **policies and recommendations**	Reaction/attitudes to formal recommendations about managing BD (e.g., MMH safety bundle) Thoughts about national or internal new **policies and recommendations** (e.g., Safety bundle)
a. Legal issues/ramifications	Thoughts (generally concerns) about legal issues/litigation risks for OBs that manage BD
a. Provider reaction/attitudes - Other	Reaction/attitudes to content not included above
1. Experience	*Should be examples of actual experiences*
a. Education	Experiences with ongoing/current education for BD or suggestions for the future *Should be examples of ongoing or future efforts, rather than demonstrating current knowledge or understanding of BD*
a. Screening	Experiences with screening for BD
a. Assessing	Experiences with assessing for BD (after positive screen or other scenarios)
i. Patients come in having **stopped medications**	Patients come in after self-discontinuing meds, or after a provider tells them to do so. *Talking about stopping meds – should include discussion of stigma*
a. Psychiatric consultations	Experiences with psychiatric consultations for BD *Should be examples of one-time (ish) consults* *Can include formal and more informal/curbside – relying on friends*
a. Treating	Experiences treating BD
i. Bridge treatment	Experiences in providing bridge treatment for BD
i. Psychiatric emergency	Experiences in handling psychiatric emergencies
a. Follow-up while treating	Experiences following-up after initial treatment or referral This is done by original provider
a. Referral for long term services	Experiences referring patients for further treatment for BD
a. Transition of care at end of perinatal period	Experiences transitioning women with BD to other care at the end of the perinatal period, including communication with other providers and care coordination
a. Time/resources	Experiences specific to time/resource allocation
i. Language/ cultural/ etc. considerations	Experiences specific to time/resource allocation that have to do with language needs, cultural, religious, sexual, etc. needs
i. Care coordination	Experiences working with other professionals *This is in contrast of one time consults - should be examples of longer-term/sustained relationships*
i. **Intra-practice** coordination	Experiences working with or relying on other staff/ assistants/ other providers within their practice
ii. **Inter-practice** coordination	Experiences working with or relying on other staff/ assistants/ other providers outside of their practice
i. Acceptance/ pushback/ stigma	Experiences with or exposure to any acceptance in OBs managing BD
i. Acceptance/stigma from **patients**	Experiences with or exposure to patient acceptance in OBs managing BD
i. Acceptance/stigma from **providers**	Experiences with or exposure to provider acceptance in OBs managing BD
a. Provider experience - Other	Other experiences in managing BD that aren't covered above
1. Provider questions	Questions providers have about any of the management of BD
1. Codebook - Other	Other provider comments that do not fit into any of the above categories.
The below categories may or may not be co-coded with the above categories	
1. Successes/Facilitators	Successes or facilitators noted *Should demonstrate more of a current example of what to do (vs. future recommendation)*
1. Challenges	Challenges noted
1. Recommendations	Provider recommendations for how to best help other providers manage BD and incorporating it into the perinatal setting *Should demonstrate more of a future example of what to do (vs. current success)*
1. Great Quotes	

Table 3.1: Demographic characteristics of clinician participants			
Characteristic	All participants (n = 31)	No exposure (n = 7)	MCPAP for Moms exposure (n = 24)
	(n,%)		
Female gender	27 (87.1)	6 (85.7)	21 (87.5)
Race			
Asian/Pacific Islander	3 (9.7)	2 (28.6)	1 (4.2)
Black/African American	1 (3.2)	0	1 (4.2)
White	24 (77.4)	5 (71.4)	19 (79.2)
Other	1 (3.2)	0	1 (4.2)
Hispanic/Latino/Latina ethnicity	1 (3.3)	0	1 (4.4)
Professional Role			
Physician	14 (45.2)	7 (100)	7 (29.2)
Nurse	6 (19.4)	0	6 (25.0)
Certified Nurse Midwife	2 (6.5)	0	2 (8.3)
Medical Assistant	8 (25.8)	0	8 (33.3)
Practice Manager	1 (3.2)	0	1 (4.2)
Years of experience (#, SD)	11.6 (10.5)	17.4 (15.6)	9.7 (7.9)
Professional setting			
Academic Medical Center	4 (12.9)	4 (57.1)	0
Health system with academic affiliation	14 (45.2)	1 (14.3)	13 (54.2)
Health system without academic affiliation	12 (38.7)	1 (14.3)	11 (45.8)
Federally Qualified Health Center	1 (3.2)	1 (14.3)	0
Screen for bipolar disorder*	19 (63.3)	2 (28.6)	17 (73.9)

Table 3.2. Participant assessment on the role of the obstetric professional in identification and treatment of BD

		No Exposure to MCPAP for Moms		Exposure to MCPAP for Moms	
Identified barriers/facilitators		**Theme?**	**Illustrative Example**	**Theme?**	**Illustrative Example**
Theme 1: Participants with adequate support see addressing perinatal BD as an important and valuable part of their role as obstetric professionals.					
Barriers	Aversion to incorporating BD into their care	X	*[Screening for BD] an unfunded mandate. You didn't get any more time in the day, you did your 25 hours, 24, and…* - ***Physician 13, No exposure***		
Facilitators	Appreciated and understood the importance of incorporating BD into their role			X	*I do [think managing BD is part of our role], you know. I mean, in conjunction with psychiatry and other support services. It's hard for just us to do it all alone, you know? I think it's a multidisciplinary treatment, right, you know? You need therapists, social workers, psychiatrists, OBs. I mean, we could all work together* - ***Physician 1, Exposure to MCPAP for Moms***
Theme 2: Participants with exposure to MCPAP for Moms perceive their patients as willing to be screened and treated for BD by their obstetric clinicians and are eager to talk about their mental health conditions.					
Facilitators	Patients are accepting of BD treatment from OB			X	*It's [screening for BD] overall positive because people [patients] are happy for the information* – ***Physician 11, Exposure to MCPAP for Moms***
	Patients exhibit less stigma about mental illness and want to talk about it			X	Yeah, there's not this stigma in psych, the psych diagnosis, that feels like it's less than it was years ago, that people are more open about talking about it, though people also say, I want to go through pregnancy on no medication, so they're weighing the risks of not being on meds and having the disease versus now the people I think are open to talking - ***Physician 4, Exposed to MCPAP for Moms***
Theme 3: Screening is occurring sporadically in places without Access Program exposure. Without adequate support, participants report seeing no point in screening					
Barriers	Screening feels futile because of paucity of resources	X	*Why screen for something that we can't do anything about?* - ***Physician 5, No exposure***		
	Unaware that validated screens exist for BD in the perinatal setting	X	*And there's probably not the simple two questions that you can ask about depression. You'd have to ask more than that to even figure it out* - ***Physician 7, No exposure***		
	Screening is occurring infrequently in places lacking support	X	*[We are not screening for BD]…just thinking about putting it into the workflow* - ***Physician 8, No exposure***		
Facilitators	Screening is occurring in most or all patients for BD in places with more support			X	*We do it [with every patient] at the suppressed menses visit* - ***Medical Assistant 1, Exposed to MCPAP for Moms***
	Access Programs may be a facilitator for implementing screening processes			X	*Before [MCPAP for Moms] this there was always kind of a futility to it where you're like, well, let's talk about depression. You should go see a psychiatrist. There's none available… You know, now there's something we can talk to them about it and then say, and we have this option for you to just actually get care instead of both laying it all on the patient* - ***Physician 9, Exposed to MCPAP for Moms***

Table 3.2. Participant assessment on the role of the obstetric professional in identification and treatment of BD

		No Exposure to MCPAP for Moms		Exposure to MCPAP for Moms	
Identified barriers/facilitators		**Theme?**	**Illustrative Example**	**Theme**	**Illustrative Example**
Theme 4: Patient assessment is one of the most challenging parts in addressing BD in perinatal patients for all obstetric clinicians, regardless of exposure level.					
Barriers	Assessment of patients with suspected or diagnosed BD is very difficult	X	*I think [bipolar disorder is] a little bit more, at least for me, it's a more scary diagnosis or it had more impact or more difficult thing to treat. Like I feel more comfortable and feel like most of the antidepressant meds would actually help depression and anxiety, but those are not necessarily better for bipolar, well, actually contraindicated, so I feel like I actually have not been screening for it, so I will try and change that* - ***Physician 7, No exposure***	X	*Well, ideally is they already have the [bipolar] diagnosis and they're already on the medication, but because again, I'm just an obstetrician…Honestly I couldn't tell you if somebody's bipolar one, two, or three and all the other subtleties that go with this…* - ***Physician 10, Exposed to MCPAP for Moms***
	Difficulties in assessment can be exacerbated by existing assumptions, misconceptions, or stigma	X	*And there's probably, I'd think there'd be a little bit of a stigma behind [a BD diagnosis] so maybe people don't tell you the truth or they downplay it as just depression* - ***Physician 7, No exposure***		
	Will send patients with suspected or diagnosed BD to higher level of care if unable to adequately assess	X	*Okay, so worst case scenario, I have a psych ER. And so, the psych ER will determine if she can be admitted to the main hospital or there's a psychiatric hospital that's five minutes away…[worst case scenario] is like if I feel like there is a danger and she's somebody who I cannot like call a friend and see if they can see her. I mean, they can't see her today. So next week. So if I feel like it can't wait, I'll do the psych ER* - ***Physician 3, No exposure***	X	*So I mean, in a jam I probably would send the patient to the emergency room* - ***Physician 10, Exposed to MCPAP for Moms***
	Discomfort with assessment properties of BD screening tool			X	*You know, so we have the screening tool [for BD] now, which it's an interesting tool. I feel like a lot of it has to be positive for it to be a positive screen, but in some patients we're, like, there's these things that does not technically rule in that concerns me for bipolar or something else, I don't know, so I guess I'm not super comfortable with it, even though I'm glad we have it –* ***Physician 11, Exposure to MCPAP for Moms***
Facilitators	Access Programs have cut down on use of ED for assessment and provided reassurance in assessment strategies			X	*Having the support of MCPAP to guide you through [assessment], that's not our specialty, and to be able to talk on the phone with the specific symptoms of the patient is very helpful –* ***Physician 12, Exposure to MCPAP for Moms***
Theme 5: With appropriate support, clinician participants can be comfortable in treating patients with medications for BD.					
Barriers	See patients with diagnosed BD that have stopped their medications	X	*I think it is variable. I've worked in three different cities and so kind of environments of different mental health and like plus or minus people that are interested in pregnant and postpartum women and that certainly makes a difference. And absolutely there's providers out there that, like, "Oh, you're pregnant, you can't be on anything." That's it. See you later.* - ***Physician 6, No exposure***	X	*Most of the people are told to stop or at least they say they were told to stop, and then you're scrambling to catch up.* - ***Midwife 1, Exposure to MCPAP for Moms***
	Feel pressure to treat their BD patients with medications and that this is unfair	X	*So there are a lot the prescribers that take care of patients while they're not pregnant, and as soon as they become pregnant, they don't talk to them, but they're fired and then they send them to an MFM, and we're like, we don't know how to do it, but we'll figure it out because nobody else will* - ***Physician 6, No exposure***	X	*I think [we're being expected to make diagnoses and we expect it of ourselves], but I definitely think, I think it's expected by the patients that we're able to manage the, you know, especially when they call their psychiatrist and the psychiatrists say, now it's up to your OB to treat you. Which really gets me. It's unfair…When you have another physician telling a patient that is, you know, your obstetrical provider should deal with this, that's just frustrating. And it happens a lot in this community* - ***Physician 1, Exposure to MCPAP for Moms***
	Unlikely to prescribe medications for BD	X	*And I would never write a prescription for bipolar disorder* - ***Physician 3, No exposure***		
Facilitators	May prescribe medications for BD under specific circumstances, such as refilling a prior prescription	X	*[I may prescribe meds for BD] if they're already on it. I feel like it's, that hopefully its working for them and they didn't already have an adverse outcome to it, so then I feel like it's less side effects to worry about or less that they're going to call me about potential side effects. That's my thought process* - ***Physician 8, No exposure***	X	*They need some help with their [BD management]. I'll redo [the prescription], reinitiate or renew it and all that, but I won't start* - ***Physician 10, Exposed to MCPAP for Moms***
	Comfortable treating patients with BD with meds, with support of an Access Program, perinatal psychiatrist, or other specialist	X	*And I feel like there's at least, in our, in [state], there are MFMs who are specializing more in mental health. They are taking it upon themselves to do more* - ***Physician 3, No exposure***	X	*I'm a lot less scared to prescribe medications than I was probably four years ago because I see the benef-, I think the benefit outweighs the risks obviously, so, but I won't start somebody on a bipolar medication if I think they're bipolar. But if they've been on it and I call and I talk to Dr. XX or Dr. YY and we go do the case and they think it's appropriate, then I will happily prescribe it* - ***Physician 1, Exposure to MCPAP for Moms***

Table 3.3. **Systemic factors reported as contributing to barriers and facilitators to address BD in the obstetric setting**

		No Exposure to MCPAP for Moms		Exposure to MCPAP for Moms	
Identified barriers/facilitators		**Theme?**	**Illustrative Example**	**Theme?**	**Illustrative Example**
Theme 6: Formal education about BD in perinatal patients is lacking. Exposure to continuing education can help					
Barriers	Lack of formal education on BD	X	*I was at a big facility [for residency] that would typically have some champion in psychiatry or perinatal psychiatrist, someone of interest who would probably give a grand rounds or something a year, but I don't know if there was any formal education. It was just kind of, you would learn in clinic that these are medicines that are typically prescribed. Again, they're typically SSRIs that are the ones you feel comfortable with* - ***Physician 2, No exposure***	X	*I did have, I did have a psych rotation, you know, 15, 20 years ago. You know, like, it was an inpatient psych unit that was completely different than really what I'm dealing with on a daily basis, you know? So you know, hopefully we have more training within our residency education and things like that, but you know, I think there's a lot of system changes that have to occur* - ***Physician 1, Exposure to MCPAP for Moms***
Facilitators	Awareness of the new standards of care for BD	X	*We need to do it [screen for BD]. I mean, the Council of Patient Safety has a lot of algorithms and recommendations and they're all based on science, and we've instituted all of them* - ***Physician 3, No exposure***	X	*And I've certainly been to enough lectures now where the topic is untreated depression, untreated anxiety causes, here's all the bad things that could happen, so it used to be no medications is best and we're going to take people off of their antidepressants. And it's certainly not, we have, I feel like we have a different mentality about that* - ***Physician 4, Exposed to MCPAP for Moms***
	Continuing education have helped to mitigate prior education deficits about the risks of untreated illness and to evolve views on the benefits of pharmacotherapy for BD			X	
Theme 7: Participants noted that there is an extreme paucity of mental health clinicians nationwide, and that barriers to care abound. Access Programs and collaboration with other professionals that have specialized mental health training can help to fill some of these gaps.					
Barriers	Paucity of psychiatric resources	X	*Psychiatry is what's really bad about the system in terms of my access. Well, I have a numbers problem. There's not enough psychiatrists in the community* - ***Physician 3, No exposure***	X	*And for many, there's many barriers. Patients not able to call. The therapists not having availability. I mean, it's just there's a paucity of services in this area, so I think a lot of these women just kind of struggle or kind of, you know, they're just sub-optimally controlled, you know? And we try our best, but what can, you know, it's hard when we feel like we don't have a ton of resources* - ***Physician 1, Exposure to MCPAP for Moms***
	Psychosocial barriers to care	X	*Yeah, so it's access and also [finding] people that are willing to take Medicaid insurance...to try to find a psychiatrist that's willing to see my non-insurance person is going be weeks. Like what are we supposed to do?* - ***Physician 6, No exposure***	X	*It's just so many psychosocial factors that go into [barriers to care]. And I find there's a lot of trauma in these women and a lot of adverse childhood experiences that they've had that shape their psyche and their mental health and their physical health* - ***Physician 1, Exposure to MCPAP for Moms***
Facilitators	Access Programs are a facilitator and mitigate access to care issues			X	*And it's also good to know that in our cases of the patients that are very unstable, is that [MCPAP for Moms] will take them for a face-to-face. So for those, again, that can get there, at least we have that, because without that we don't have anything. So we can get them to Worcester or Boston hopefully and they can get a face-to-face and at least have some ongoing management* - ***Physician 12, Exposure to MCPAP for Moms***

Table 3.3. **Systemic factors reported as contributing to barriers and facilitators to address BD in the obstetric setting**

		No Exposure to MCPAP for Moms		Exposure to MCPAP for Moms	
Identified barriers/facilitators		**Theme?**	**Illustrative Example**	**Theme?**	**Illustrative Example**
Theme 8: Coordination of care with outside psychiatric professionals remains a challenge for all participants, regardless of exposure					
Barriers	Encountered or tried to work with or refer to other clinicians that do not want to treat perinatal patients with BD	X	*It's the same reason why we can't get some psychiatrists to keep seeing the patients. It's this fear of liability and fear of pregnancy. And potential exposures and litigations. So they just stop and we don't want to do it and we're not, it's conscientious objection to taking care of a pregnant woman that's going to be on medications.-* ***Physician 6, No exposure***	X	*Yeah, I mean, I think we've tried to outreach [to providers] about a couple patients that I can think of, and you know, it really, they don't call back or I think they're, like, oh, they're pregnant, it's off my plate…* - ***Physician 1, Exposure to MCPAP for Moms***
	There are communication difficulties that specific to dealing with patient mental health information	X	*I think that goes to when you request records from somebody. It's in the document and there's special boxes that you have to check that, like HIV, and [mental health] and substance abuse are kind of a specialized category of things, so that does impair…I think also if I got more of the [information from the records] of what is happening, I probably would learn over time, this is how they got managed and so I would boost my confidence to maybe step it up a little bit and maybe I would be more comfortable in sort of a little more complex patients* - ***Physician 6, No exposure***		

Table 3.4. **Participant-identified recommendations for integrating the treatment of BD into the obstetric setting**

	No Exposure to MCPAP for Moms		Exposure to MCPAP for Moms	
Recommendation	**Theme?**	**Illustrative Example**	**Theme?**	**Illustrative Example**
Recommendation 1: Obstetric professional comfort and competency in managing perinatal BD may be increased with educational efforts and easily accessible resources				
Emphasis on educating trainees	X	*She had the psychiatric nurse practitioner, so having someone of relevance educating the residents* - ***Physician 3, No exposure***		
Education specific to the steps along the mental health care pathway	X	*Tell us how. Tell us how and how much time it takes* - ***Physician 8, No exposure***	X	*I think it'd be helpful to have, like, the recommendation of how frequently [to follow-up with patients with BD] because sometimes it does feel like we're prescribing that medication and then they disappear into the void…* - ***Physician 9, Exposed to MCPAP for Moms***
Help on distinguishing BD from other mental health conditions	X	*Another thing that I feel like with depression, I'm a little bit more comfortable making that call, but with something above and beyond that, like a psychotic disorder or a bipolar, I kind of feel like my distinguishing abilities as an MFM is less* - ***Physician 6, No exposure***	X	*I guess I also worry sometimes that, is there certain things that can be misdiagnosed as bipolar? In thinking of other medical scenarios, it's not only enough to know how something presents, but what are the things that can fool you and make you think it's this, but it's really something else* – ***Physician 14, Exposed to MCPAP for Moms***
More information to understand the risk/benefit profile of BD meds and to recognize their side effects	X	*If I had a list of specific side effects that I needed to know about and I put that in their problem list and I read it every time they came in, I would probably be okay with that* - ***Physician 5, No exposure***	X	*Because we are more comfortable with the SSRIs, it'd be nice to have the review on the [BD] meds, on the current meds… So sure, and then for some of the counseling and, you know, maternal fetal medicine has their little blurb that they do for lithium and for different meds then whether or not to do an echo or whatever, but it'd be nice to sort of have a review* - ***Physician 4, Exposed to MCPAP for Moms***
Emphasis on destigmatizing mental health conditions for clinicians and patients	X	*And is there a way to like soften the term bipolar. Like what if the patient says, my doctor just called me crazy and I'm not going to go back and see her, then we've lost them. So how to talk to the patient about it?* - ***Physician 7, No exposure***		
Use of Grand Rounds and other lecture series as a venue for education	X	*I mean, get some more speakers out there. I mean, I would have speakers when I'm on grand rounds* - ***Physician 3, No exposure***	X	*Yeah, just [a series of] rotating topics, because I'd probably need to relearn these things every year, so every, you know, few months a little quick update or…* – ***Physician 11, Exposure to MCPAP for Moms***
Creation of more online content and education	X	*Some video content I think would be helpful that people just watch in their spare time* - ***Physician 2, No exposure***		
Circulation of more treatment algorithms and clinical decision-making tools	X	*I like one-pagers. A front and a back. Something that I can have on my desk or have in my frequently referenced pieces of paper that I just say, all right, hey, did I ask this question or this is my next move, something like that. So a one-pager* - ***Physician 7, No exposure***	X	*If we had a protocol we could follow or something where you can say, like, OK, if we're gonna start someone on Risperdal like, we're gonna follow up in three months and then we're gonna do the A1c…something like that* - ***Physician 9, Exposed to MCPAP for Moms***
Outreach to other clinicians around preventative care			X	*I know we're talking from the OB side, but I think also on the psychiatry side, kind of like spreading the word [about not stopping meds]. Like at least, you know, think twice before you [stop them]* – ***Physician 14, Exposed to MCPAP for Moms***

Table 3.4. **Participant-identified recommendations for integrating the treatment of BD into the obstetric setting**

	No Exposure to MCPAP for Moms		Exposure to MCPAP for Moms	
Recommendation	**Theme?**	**Illustrative Example**	**Theme?**	**Illustrative Example**
Recommendation 2: Incorporation of the management of BD in the obstetric setting may be further facilitated by recommending efficient ways to integrate practices into existing workflows				
Include discussion of BD into appointments with fewer required tasks	X	*We just kind of like talk about [perinatal depression] at a certain appointment I think, like maybe an appointment where you don't have a lot going on* - ***Physician 7, No exposure***		
Leverage other professionals in the OB practice to assist	X	*I work in a particularly resource-poor setting and lots of people are doing lots of things, but what I really learned over the years is leveraging my health care assistants to do a lot for me, and because they are all bilingual also…to give patients the info and just explain that Dr. __ wants you to do X and she will be with you afterwards, and that's at least a couple of minutes that I don't need to do that piece of it, so I think that's where I think I would be interested in some assistance* - ***Physician 8, No exposure***		
Integration of BD screeners and reminders into the Electronic Medical Record (EMR/HER)	X	*But I think your comment about EHR is really important because I think sometimes, particularly when we share about the record with internists and family that we don't remember to put our OB diagnoses in there so everyone can see and vice versa, so I think it's really important for us to put postpartum depression on that shared list, even though the postpartum period may be over, that's still a flag for the internist who sees them. Maybe I should really talk to that lady about what she's doing now. I think we don't do a good job with our problem list* - ***Physician 8, No exposure***		
Use of patient registries in the practice to help with follow-up			X	*Following up with patients, I think [having a patient registry] where we keep track of patients so closely, I think other practices could benefit from doing the same. I think that's really helpful* – ***Medical Assistant 2, Exposure to MCPAP for Moms***
Recommendation 3: Employment of integrated care models and other innovative care delivery methods for patients and babies				
Embedded psychiatric professionals into OB practices	X	*I will say that what has totally changed my practice in the last 12 months is our health center organization has undergone a pilot projection, which we are continuing with sort of embedding psychiatric social workers in every one of our sites. So I now have the ability to talk to woman who is distraught and has other social stressors and clearly probably a diagnosis, who I can literally say, "Would you like to talk to [social worker] today?" And [social worker] can come over and talk to her* - ***Physician 8, No exposure***		
Use of Perinatal Psychiatry Access Programs or other consultative professionals with mental health expertise	X	*We have OB Med so that's a different specialty that has perhaps a little comfort in the behavioral stages, so I mean, they're not psychiatrists, but it's a specialty of internists who have done some intake for pregnancy woman with medical issues including behavioral health* - ***Physician 8, No exposure***	X	*And [having access to MCPAP for Moms has] been huge to have that as a resource and referral options, so sometimes she'll take time to set someone up with therapy, other times she just works with our social worker or gets them set up with another therapist or other needs. And that's amazing. Every practice should have that* – ***Physician 11, Exposure to MCPAP for Moms***
Leveraging telemedicine and direct patient care over telemedicine	X	*One thing that might be nice for you and for anybody else would be like, I don't know how comfortable I feel, like psych is doing more with tele medicine, but that would be essentially your visit, but you don't have to travel* - ***Physician 7, No exposure***	X	*Maybe telemedicine, like, you know, I think that could really work in a psych setting, you know for a psychiatric issue, you know, with technology today and things. You could do that in the hospital. We could do that here* - ***Physician 1, Exposure to MCPAP for Moms***
Inclusion of more comprehensive assessment strategies			X	*I think more trauma-informed approaches would be helpful other places* – ***Physician 11, Exposure to MCPAP for Moms***

Table 3.5: Associations with themes by exposure status, based on the number of times the themes were coded

Theme	All participants	No exposure	MCPAP for Moms exposure
	%[a]		
Formal education about bipolar disorder in perinatal patients is lacking. Exposure to continuing education can help	9.0	8.7	9.3
Screening is occurring sporadically in places without Access Program exposure. Without adequate support, participants report seeing no point in screening	9.0	10.6	7.2
Patient assessment is one of the most challenging parts in addressing bipolar disorder in perinatal patients for all obstetric clinicians, regardless of exposure level*	**8.0**	**3.9**	**12.4**
Clinician participants can be comfortable in treating patients with medications for bipolar disorder with the appropriate support	19.4	14.4	24.7
All participants noted that there is an extreme paucity of mental health clinicians nationwide, and that barriers to care abound. Access Programs and collaboration with other professionals that have specialized mental health training can help to fill some of these gaps	13.4	15.4	11.3
Participants with adequate support see addressing perinatal BD as an important and valuable part of their role as obstetric professionals.	2.0	1.9	2.1
Participants with exposure to Access Programs perceive their patients as willing to be screened and treated for BD by their obstetric clinicians and are eager to talk about their mental health conditions*	**3.0**	**0**	**6.2**
Coordination of care with outside psychiatric professionals remains a challenge for all participants, regardless of exposure	6.0	5.8	6.2
Facilitators* **	**28.4**	**15.4**	**42.3**
Barriers	41.3	45.2	37.1
Recommendations**	**30.4**	**39.4**	**20.6**
Clinician comfort and competency in managing perinatal BD may be increased with educational efforts and easily accessible resources	16.9	20.2	13.4
Incorporation of the management of BD in the obstetric setting may be further facilitated by recommending efficient ways to integrate practices into existing workflows	6.5	8.7	4.1
Employment of integrated care models and other innovative care delivery methods for patients and babies*	**6.0**	**9.6**	**2.1**

Aim 3

Table 4.1: Operationalization of study exposure and outcome variables of MCPAP for Moms utilization		
Conceptualized domain	***Specific MCPAP for Moms data for measurement***	***Hypotheses***
Study exposures, to suggest utilization of the MCPAP for Moms program		
Utilization of any encounter type	**Count** of any encounter type in MCPAP for Moms (# encounters with MCPAP for Moms/year)	Exposure will increase treatment rates, as utilization should be educational
Utilization of phone consultations with calling clinician	**Count** of only those in which the encounter type was a phone consultation with a calling clinician. In these encounters, a consulting psychiatrist provides recommendations to the calling clinician to help them provide direct patient care (# phone consultations/year)	Exposure will increase treatment rates, as phone consults are a tailored educational experience for the calling clinician and utilization should be educational
Utilization of face-to-face consultations with patients	**Count** of only those in which the encounter type was a one-time face-to-face consultation with a patient. This is followed by a discussion between the consulting psychiatrist and the calling clinician about the patient, allowing them to compare assessments and for the psychiatrist to provide specific recommendations about clinical care. (# face-to-face consultations/year)	Exposure will increase treatment rates, as phone consults are a tailored educational experience for the calling clinician and utilization should be educational
Utilization of resource and referral encounters	**Count** of those in which the encounter type involves resources and referrals only. In these encounters, a resource and referral specialist will make recommendations to the calling clinician. (# resource and referral encounters/year)	Exposure may or may not increase treatment rates. This encounter involves a provision of resources, rather than education and subsequent clinician experience in providing direct patient care
Study outcomes, to suggest increased treatment rates by the calling clinician and increased complexity of treatments for perinatal mental health conditions		
Count data, estimating management of mental health conditions with more frequency and complexity	**Count** of encounters annually that end with the calling clinician resuming treatment	Increasing count → increasing treatment rates
	Count of encounters annually that end with the calling clinician resuming treatment **for unipolar depression** vs. count for **bipolar disorder**	If counts of depression treatment ≤ bipolar disorder → increasing treatment complexity If counts of depression treatment > bipolar disorder → no change in treatment complexity

Aim 3: Details about regressions

Sample: calling clinicians that interacted with the MCPAP for Moms program

- Characteristics measured at first encounter and considered time invariant

Models: longitudinal negative binomial models were used to estimate Incidence Rate Ratios (IRR)

- chosen over Poisson because evidence of over-dispersion
- Included clinicians that can prescribe medications only (physicians, nurse practitioners, physician assistants), as the treatment outcomes often refer to prescription of pharmacological therapies.

Model building: univariate associations of covariates & outcomes examined first, using 10% rule with each outcome & literature

- Only calling clinician location in a rural community (yes/no) was included in the final, adjusted models
- Given that healthcare utilization changes are associated w/ COVID-19, sensitivity analyses were conducted in which the study time period ended one year earlier (June 2019)

Data field	Definition	Code options
ENCOUNTERID	Label identifying encounter date and provider	
MEMBERID	De-identified record ID	
DATEOFSERVICE	Date of encounter	
PRACTICEPROVIDERID	Provider ID	
PROVIDER_NAME	Provider that initiated encounter's name	
FKPROVIDERTYPE	Type of Provider	Pediatrician; Family Physician; Physician Asst; BH Clinician; BH Clinician/Care manager; PCMH Care Coordinator; Internal Medicine Physician; Nurse Practitioner; Obstetrician; Midwife; Psychiatrist; Other RN/LPN ; Other (*specify*)
PRACTICEID	Practice ID	
PRACTICENAME	Practice that provider that initiated encounter belongs to	
ACTIVITY	Nature of the encounter	BH network mgmt., Case conference, Case supervision, CME, Documentation only, Email, Face-to-Face Follow up, Face-to-Face In-Person, Face-to-Face No-show, Face-to-Face Phone, Face-to-Face Same day, Face-to-Face Video, Non Pt specific consultation, On the Fly consult, Phone f/u no connection, Phone other, Phone provider, Phone provider follow up, Phone to Family/Patient, Practice engagement, R&R - Follow up, R&R - outreach to patient, R&R - Resources to provider, SUD Training
DXNAME	Diagnoses related to encounter	Choose all that apply: Major Depressive Disorder; Persistent Depressive Disorder (Dysthymia); Unspecified Depressive Disorder; Substance/Medication Induced Depressive Disorder; Major Depression with Psychotic Features; Bipolar I; Bipolar II; Unspecified Bipolar and Related Disorders; Bipolar I with psychotic features; Substance/Medication Induced Bipolar and Related Disorders; Borderline Personality Disorder; Generalized Anxiety Disorder; Panic Disorder; Unspecified Anxiety Disorder; Schizophrenia; Schizoaffective Disorder; Unspecified Psychotic Disorder; OCD; Adjustment Disorder; PTSD; Unspecified Trauma/Stress related; ADHD; Complicated Grief Disorder; Eating Disorder; Other (*specify*); Deferred Diagnosis; Not Applicable
DXSUDNAME	SUD diagnoses related to encounter	Choose all that apply: Cocaine use disorder; Alcohol use disorder; Cannabis use disorder; Opioid use disorder; Benzodiazepine use disorder; Tobacco use disorder; Amphetamine use disorder; Use denied; Use not discussed; Other use disorder
OUTCOME	Outcome after encounter	Choose all that apply: Back to Provider; Face to Face visit; Refer to an existing psychiatrist; Refer to a new psychiatrist; Refer to partial hospital; Bridge treatment with calling provider; Refer to psychiatric emergency services; Refer to mobile crisis services; Refer to support group; Refer to outpatient therapist; Refer to Parent/Infant therapy; Refer to psychotherapy group; R&R - Resources to Provider; R&R - Outreach to patient; None
CONTACTREASON	Reason for the encounter initiation	Choose all that apply: Lactation question(s); Risk/benefits of med use in pregnancy; Positive screen; Medication question(s); Preconception question(s); Diagnostic question(s); Resources - Community access; Safety concerns; Screening tool question; Risks of substance use; Engagement in care COVID-19; Trauma exposure; Race/Racial discrimination; Mental health stigma; LGBTQ needs; Other (*specify*); Non member specific
MEDICATION	Medications recommend from the encounter/consultation	Choose all that apply: Antidepressants – SSRI; Antidepressants – SNRI; Antidepressant – Tricyclic; Antidepressants – other; Lithium; Lamictal; Gabapentin; Mood stabilizer – other; Haldol; Perphenazine; Atypical antipsychotic; Typical Antipsychotic – other; Benzodiazepine; Other sleep/anxiety agent; Stimulant; Naltrexone; Buprenorphine; Methadone; Other (*specify*); No meds after encounter
INTMEDICATIONACTIVITYIDFK	Activities related to the medication recommended from the encounter/consultation (numerical code)	Choose all that apply: Refer med treatment; Start first meds; Increase meds; Decrease meds; Add meds; Change meds; No meds before encounter; Non patient specific encounter; Taper off meds; No change
NAME	Activities related to the medication recommended from the encounter/consultation (corresponding text)	
MEASURE_CODE	Other related measure that was captured during the encounter (numerical code)	Choose all that apply: Patient status; EPDS score; PHQ-9 score; Self harm question 5- MDQ
M4M_MEASURE_NAME	Other related measure that was captured during encounter (corresponding text)	
M4M_MEASURE_VALUE	Response/outcome for measure (*above*) *dependent upon which measure code/M4M_Measure_Name selected*	Choices for Measure code = 1- Patient status (choose 1): 1st trimester; 2nd trimester; 3rd trimester; Postpartum lactating; Postpartum not lactating; Postpartum lactation unknown; Post adoption; Father; Preconception; Perinatal loss
		Choices for Measure code = 2- EPDS score (choose 1): 0-8; 9-12; 13-18; >=19; N/A
		Choices for Measure code = 3- PHQ-9 score (choose 1): 0-9; 10-14; 15-19; >=20; N/A
		Choices for Measure code = 4- self harm question (choose 1): 0; 1; 2; 3; 4; N/A
		Choices for Measure code = 5- MDQ (choose 1): Positive; Negative; N/A

Table 4.2: Characteristics of calling clinicians that utilized MCPAP for Moms	
Characteristic	**All calling clinicians** (n = 1,006)
	(n,%)
Professional credentials	
Physician	583 (59.9)
Midwife	199 (20.4)
Nurse Practitioner/ Physician Assistant	180 (18.5)
Other[a]	12 (1.2)
Clinician specialty/discipline	
Obstetrics/Gynecology	753 (76.4)
Family Medicine	84 (8.5)
Internal Medicine	24 (2.4)
Psychiatry	94 (9.5)
Pediatrics	31 (3.1)
Region of Massachusetts[b]	
Boston-area	182 (22.1)
Central	191 (23.2)
Western	174 (21.1)
Metro-west	114 (13.9)
Southeast	107 (13.0)
Northeast	51 (6.2)
Cape and the Islands	4 (0.5)
Average number clinicians in practice	
1-5 Clinicians	50 (6.8)
6-10 Clinicians	111 (15.1)
11-20 Clinicians	189 (25.8)
21-50 Clinicians	293 (39.9)
51+ Clinicians	91 (12.4)
Average # annual practice births	
Up to 100	35 (5.6)
101-500	229 (36.5)
501-1000	220 (35.0)
1000+	144 (22.9)
Clinician in rural setting	20 (2.5)
Median income of community in which obstetric practice is located	
< $40,000	94 (13.0)
$41-50,000	179 (24.8)
$51-65,000	210 (29.1)
$65-100,000	137 (19.0)
$100,000+	101 (14.0)
Average # annual encounters (mean, SD)	
Year 1 (7/2014 – 6/2015)	1.2 (5.9)
Year 2 (7/2015 – 6/2016)	2.3 (6.4)
Year 3 (7/2016 – 6/2017)	2.5 (6.5)
Year 4 (7/2017 – 6/2018)	2.8 (7.6)
Year 5 (7/2018 – 6/2019)	3.2 (7.9)
Year 6 (7/2019 – 6/2020)	2.7 (6.3)
[a]Other = Nurse, SW, "BH professional", office administrator; [b]Regions were created by MA county	
Missing data: professional credentials (32); specialty/discipline (20); region (183); practice size (272); births (378); rural (203); income (289)	

Primary analysis results - association of repeated encounters (by type) on "clinician treats" at encounter conclusion, by diagnosis

	Any diagnosis		Unipolar depressive disorders		Bipolar-spectrum disorders	
	IRR[a]	*95% CI*[b]	*IRR*[a]	*95% CI*[b]	*IRR*[a]	*95% CI*[b]
Any encounter type						
Exposure to any encounter type	**1.07**	**1.06 to 1.07**	**1.06**	**1.06 to 1.07**	**1.07**	**1.06 to 1.08**
Time	**0.94**	**0.91 to 0.97**	**0.88**	**0.85 to 0.92**	**1.10**	**1.02 to 1.19**
Rural community	**3.58**	**2.17 to 5.90**	**3.09**	**1.78 to 5.36**	**6.32**	**2.33 to 17.13**
Phone consultations with calling clinicians						
Exposure to phone consultations with calling clinicians	**1.30**	**1.28 to 1.33**	**1.31**	**1.28 to 1.34**	**1.25**	**1.20 to 1.29**
Time	0.99	0.96 to 1.02	**0.94**	**0.91 to 0.97**	**1.12**	**1.04 to 1.21**
Rural community	**1.50**	**1.04 to 2.16**	1.23	0.77 to 1.85	**3.28**	**1.46 to 7.36**
Face-to-face assessments with patients						
Exposure to face-to-face assessments with patients	**1.70**	**1.60 to 1.81**	**1.66**	**1.53 to 1.79**	**2.12**	**1.86 to 2.41**
Time	**0.90**	**0.86 to 0.93**	**0.86**	**0.82 to 0.89**	1.00	0.93 to 1.08
Rural community	**2.09**	**1.21 to 3.62**	1.68	0.91 to 3.07	**2.86**	**1.18 to 6.94**
Resource and referral encounters						
Exposure to resource and referral encounter type	**1.05**	**1.05 to 1.06**	**1.06**	**1.05 to 1.07**	**1.07**	**1.05 to 1.09**
Time	**0.93**	**0.90 to 0.96**	**0.88**	**0.84 to 0.91**	**1.10**	**1.01 to 1.19**
Rural community	**3.89**	**2.17 to 6.95**	**3.54**	**1.91 to 6.57**	**7.23**	**2.47 to 21.15**

Sensitivity analysis results - association of repeated encounters (by type) on "clinician treats" at encounter conclusion, by diagnosis, excluding the dates of the COVID-19 pandemic						
	Any diagnosis		Unipolar depressive disorders		Bipolar-spectrum disorders	
	IRR[a]	*95% CI*[b]	*IRR*[a]	*95% CI*[b]	*IRR*[a]	*95% CI*[b]
Any encounter type						
Exposure to any encounter type	**1.07**	**1.06 to 1.08**	**1.07**	**1.06 to 1.08**	**1.07**	**1.06 to 1.09**
Time	**0.93**	**0.89 to 0.96**	**0.87**	**0.83 to 0.92**	**1.19**	**1.08 to 1.31**
Rural community	**3.18**	**1.92 to 5.27**	**2.64**	**1.45 to 4.81**	**5.33**	**1.96 to 14.50**
Phone consultations with calling clinicians						
Exposure to phone consultations with calling clinicians	**1.31**	**1.28 to 1.33**	**1.32**	**1.29 to 1.36**	**1.26**	**1.21 to 1.32**
Time	1.03	0.99 to 1.07	0.98	0.93 to 1.02	**1.30**	**1.17 to 1.43**
Rural community	**1.64**	**1.13 to 2.39**	1.30	0.79 to 2.16	**3.02**	**1.36 to 6.73**
Face-to-face assessments with patients						
Exposure to face-to-face assessments with patients	**1.63**	**1.52 to 1.75**	**1.61**	**1.48 to 1.76**	**2.10**	**1.80 to 2.44**
Time	**0.91**	**0.87 to 0.96**	**0.87**	**0.82 to 0.91**	1.11	0.997 to 1.23
Rural community	**2.01**	**1.15 to 3.51**	1.58	0.84 to 2.98	**2.56**	**1.04 to 6.34**
Resource and referral encounters						
Exposure to resource and referral encounter type	**1.07**	**1.06 to 1.08**	**1.07**	**1.05 to 1.08**	**1.07**	**1.05 to 1.10**
Time	**0.92**	**0.88 to 0.95**	**0.86**	**0.81 to 0.90**	**1.18**	**1.07 to 1.31**
Rural community	**3.75**	**2.11 to 6.66**	**3.09**	**1.59 to 6.00**	**6.72**	**2.30 to 19.69**

Aim 3: Details about GBTM

- The majority of calling clinicians enrolled during the first two years of the program, we examined a subset of clinicians that enrolled in the first calendar year (July 2014 – July 2015, n=362) for this sub-analysis, to reduce missing data across time points.
    - A series of zero-inflated Poisson models were fitted to estimate clinician trajectory groups, based on total count of any encounter with the program annually.
    - Models were evaluated with a range of two to six subgroups and evaluated for model fit. This was done by incrementally increasing each model by one subgroup and evaluating model fit statistics (BIC, AIC) as well as graphical display.
    - Once the number of sub-groups was determined, the order of the polynomial for each group of the number of encounters and the excessive zeros was varied from linear to quadratic and evaluated for model fit, using the same methods as stated above.
    - After choosing the final model, we assigned each clinician into the trajectory group with the highest posterior probability.
    - Descriptive labels were assigned for ease of reference based on trajectory shape. Using the final sub-groups for each clinician, we ascertained group prevalence, associated characteristics, and associated outcomes

Supplementary Table S4.2: **Model evaluation of exploratory group-based trajectory modeling of clinician subgroups.**

Subgroup # (order)						Polynomial (iorder)						Sample size BIC	BIC	AIC
0	0					0	0					-3933.11	-3939.10	-3923.38
0	0	0				0	0	0				-3532.24	-3541.83	-3516.67
0	0	1				0	0	0				-3534.74	-3545.53	-3517.23
0	**0**	**1**				**0**	**0**	**1**				**-3537.15**	**-3549.14**	**-3517.69**
0	0	1				0	0	-1				-3563.28	-3572.87	-3547.71
0	1	1				0	0	0				-3537.35	-3549.34	-3517.89
0	1	1				0	0	1				-3539.75	-3552.94	-3518.35
0	1	1				0	1	1				-3540.81	-3555.20	-3517.46
0	1	1				0	0	0				-3537.35	-3549.34	-3517.89
0	1	1				0	-1	-1				-3602.09	-3611.68	-3586.52
0	1	1				0	0	-1				-3565.89	-3576.68	-3548.37
0	1	2				0	0	0				-3537.78	-3550.97	-3516.38
0	1	2				0	0	1				-3540.18	-3554.57	-3516.83
0	1	2				0	1	1				-3541.24	-3556.83	-3515.95
0	1	2				1	1	1				-3544.17	-3560.95	-3516.93
0	1	2				0	0	-1				-3566.02	-3578.01	-3546.56
0	1	2				0	-1	-1				-3602.22	-3613.01	-3584.71
0	0	2				0	0	0				-3535.18	-3547.17	-3515.72
0	0	2				1	1	1				-3542.44	-3558.02	-3517.14
0	0	2				0	0	1				-3537.58	-3550.77	-3516.17
0	0	2				0	0	-1				-3563.41	-3574.20	-3545.90
1	1	2				0	0	0				-3540.32	-3554.71	-3516.97
1	1	2				0	0	1				-3542.72	-3558.31	-3517.43
1	1	2				0	0	-1				-3568.56	-3581.75	-3547.15
1	1	2				1	1	1				-3547.11	-3565.10	-3517.92
2	2	2				0	0	0				-3542.04	-3558.83	-3514.80
0	0	0	0			0	0	0	0			-3490.29	-3477.10	-3455.70
0	0	0	0	0		0	0	0	0	0		-3445.87	-3462.66	-3418.63
0	0	0	0	0	0	0	0	0	0	0	0	-3461.05	-3440.67	-3407.59

Table 4.4: Characteristics of exploratory GBTM-based clinician sub-groups, based on MCPAP for Moms utilization data			
Characteristic	**Low and stable utilizers** (n=289)	**Moderate and stable utilizers** (n=59)	**High and increasing utilizers** (n=14)
Professional credentials*			
Physician	243 (77.9)	55 (17.6)	14 (4.5)
NP/PA	45 (93.8)	3 (6.3)	0
Specialty/discipline***			
Obstetrics/Gynecology	224 (81.5)	48 (17.5)	3 (1.1)
Family Medicine	49 (92.5)	2 (3.8)	2 (3.8)
Internal Medicine	2 (33.3)	2 (33.3)	2 (33.3)
Psychiatry	4 (33.3)	3 (25.0)	2 (41.7)
Pediatrics	4 (44.4)	3 (33.3)	2 (22.2)
Year of enrollment***			
2014	156 (72.6)	45 (20.9)	14 (6.5)
2015	133 (90.5)	14 (9.5)	0
Region of Massachusetts***			
Boston-area	58 (89.2)	7 (10.8)	0
Central	115 (78.2)	26 (17.7)	6 (4.1)
Western	71 (81.6)	15 (17.2)	1 (1.2)
Metro-west	13 (65.0)	2 (10.0)	5 (25.0)
Southeast	10 (71.4)	3 (21.4)	1 (7.1)
Northeast	8 (57.1)	5 (35.7)	1 (7.1)
Average # annual encounters (mean, SD)			
Year 1 (7/2014 – 6/2015)	3.1 (3.2)	10.6 (9.1)	26.6 (28.8)
Year 2 (7/2015 – 6/2016)	3.8 (4.1)	11.6 (10.0)	30.2 (16.9)
Year 3 (7/2016 – 6/2017)	3.9 (4.3)	11.4 (11.9)	22.9 (12.5)
Year 4 (7/2017 – 6/2018)	3.7 (3.6)	11.9 (15.6)	28.4 (21.8)
Year 5 (7/2018 – 6/2019)	4.4 (4.6)	14.3 (18.1)	28.5 (20.7)
Year 6 (7/2019 – 6/2020)	4.3 (4.1)	11.6 (15.1)	25.1 (17.2)
Outcome comparisons[a]			
Clinician treats	Reference	IRR = 2.8 [2.3 to 3.3]	IRR = 11.3 [5.4 to 23.8]
Clinician treats, unipolar depressive diagnoses	Reference	IRR = 3.0 [2.5 to 3.7]	IRR = 11.3 [5.0 to 25.2]
Clinician treats, bipolar-spectrum diagnoses	Reference	IRR = 1.8 [1.3 to 2.6]	IRR = 13.5 [4.2 – 43.2]