

## **ONLINE APPENDIX - Mobile application for monitoring and management of depressed mood in a vulnerable pregnant population**

### **Additional Detail on Methods**

Participants randomized to the incentive condition were informed that they would be entered into a lottery if they completed at least 70% of the daily mood ratings administered by the MTA. (The lottery included one prize of \$50 cash, and five prizes of a package of diapers.) Randomization was performed prior to enrollment via a random digit selection calculator. The conditions were consecutively assigned to envelopes prepared and sealed before enrollment initiated. These envelopes were opened at enrollment, unblinding both the research staff and participants. To ensure the research staff did not influence application(s) usage, no contact with the participants was initiated by the research staff until the end of the study (8 weeks) when an exit interview was carried out. For statistical analyses, race was dichotomized as African American versus other. Marital status was dichotomized as married versus never married, separated or divorced. Employment was categorized as “employed” (full-time or part-time work) and “unemployed.” Education was dichotomized into those with a high school education or less versus those who had beyond a high school education.

### *Description of Mobile Applications*

**Patient Portal (PP) App:** The patient portal (PP) mobile application is a standard product of the EHR utilized at this health center (EPIC; EPIC Systems Corporation, Verona, WI) and is available to all registered patients. The application allowed its users to view

upcoming appointments, request prescription refills, review test results, and initiate contact (e.g. send a question electronically) with their care team, among other features.

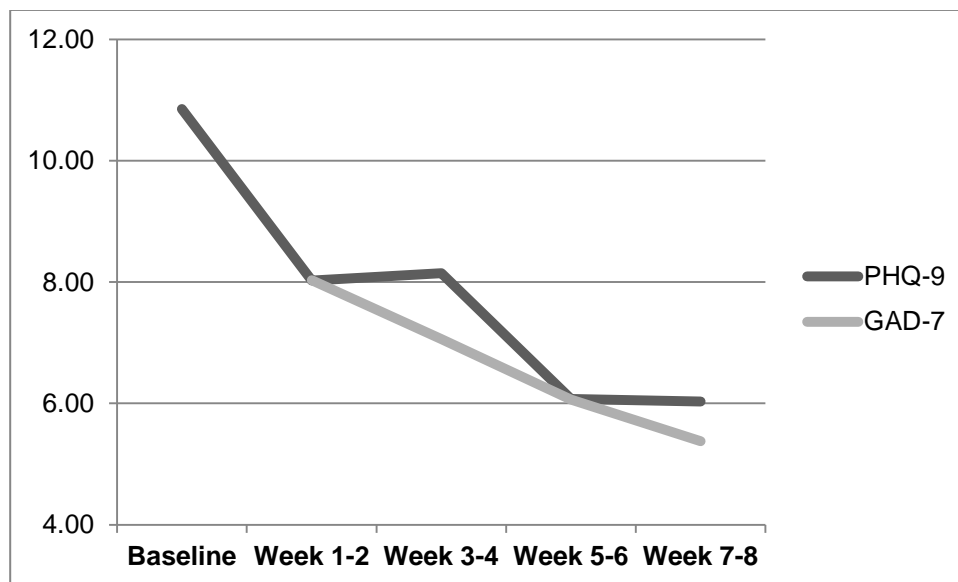
**Mood Tracking and Alert (MTA) App:** The MTA app was a HIPAA- compliant password-protected mobile application that provides brief education on mental health and monitors mood through the delivery of daily mood symptom surveys as well as monitoring users' physical activity patterns as recorded by the mobile device through global positioning system (GPS) and use of the telephonic and internet functions of the device. The app prompted participants to complete brief daily mood questions and longer weekly surveys. The daily survey comprised two items: 1) "Have you felt little interest or pleasure in doing things?" 2) "Have you felt down, depressed, or hopeless?" Responses ranged from 1 "not at all" to 5 "most of the day". The weekly surveys alternated between the PHQ-9 depression survey and the GAD-7 which assesses anxiety symptoms. When the app detected a trend in worsening mood symptoms, alerts were generated for the prenatal providers, advising them to initiate contact with the participants. These alerts were sent to the providers in response to worsening self-reported symptoms, record of any thoughts of self harm on the PHQ-9 (1 or greater on item 9), or changes in the physical or mobile device use patterns from baseline. In this study, the providers who received the alerts and initiated telephone contact were licensed social workers or a clinical psychologist, who were experienced in treating women with perinatal mental health concerns.

## SUPPLEMENTAL TABLES AND FIGURES FOR ONLINE APPENDIX

**MTA Mobile App Acceptability.** n (%) who Agree “Quite a bit” or “Strongly” in week 8

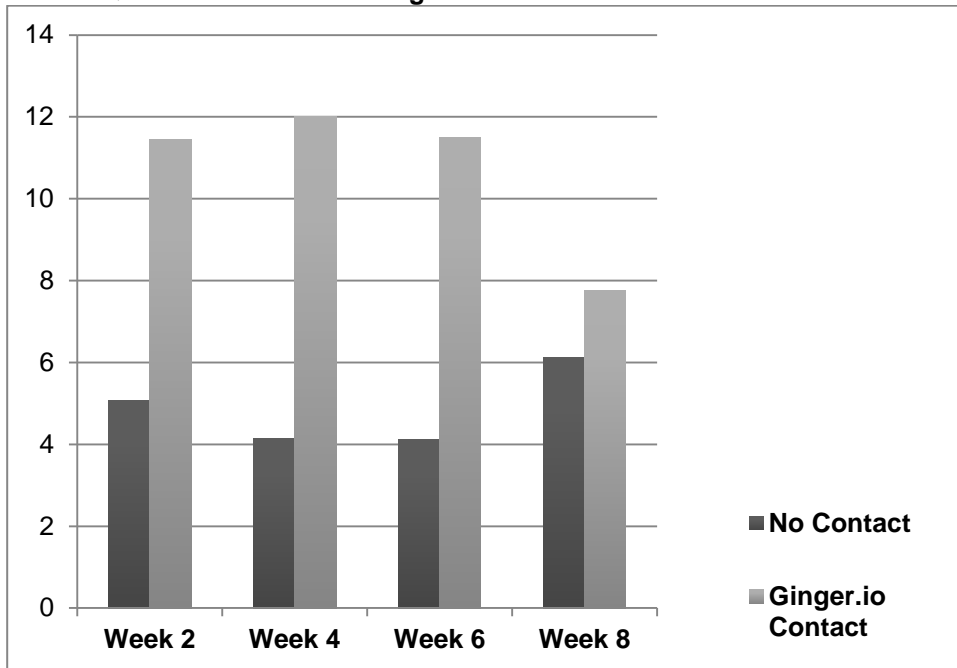
Acceptability Questions	N	%
The MTA app is easy to use	22	84%
The time required of me to answer questions in the MTA app is reasonable.	21	81%
On a scale of 0-10, how likely are you to recommend MTA to a friend or colleague? (Rating of [7] – [10], indicating high likelihood.)	19	73%
I am satisfied with the overall MTA experience.	18	69%
MTA helps me feel I am able to be more open and honest about how I am feeling.	16	61%
MTA helps me feel more confident that I am able to manage my mental health condition.	13	50%
MTA helps me feel like my care team understands and responds to my unique needs.	11	42%
MTA helps me feel more connected to my doctor or care team.	9	34%

### PHQ-9 and GAD-7 across the eight week trial



PHQ-9 and GAD-7 scores decreased across the eight week trial among MTA app users.  
 PHQ-9: Possible scores range from 0 to 27, with higher scores indicating greater depressive symptomatology.  
 GAD-7: Possible scores range from 0 to 21, with higher scores indicating greater anxiety symptomatology.

**Mean PHQ-9 scores across the eight week trial within MTA users.**



MTA app users who triggered a provider call had higher PHQ-9 scores than MTA app users who did not trigger a provider call.

PHQ-9: Possible scores range from 0 to 27, with higher scores indicating greater depressive symptomatology.