

## the Use of mHealth to Improve Fetal Outcomes

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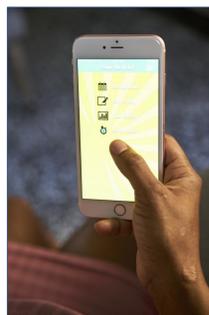
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### Mobile Applications as Health Interventions

- Mobile applications for the purpose of tracking one's health are becoming increasingly popular<sup>1</sup>
- Mobile apps not only promote healthy behavior and prevent negative health outcomes, they can also be a satisfying experience for users<sup>3,4</sup>
- Previous research conducted with pregnant women enrolled in Medicaid programs showed the use of a mobile application to promote prenatal care behaviors may improve birth outcomes

### Improving Birth Outcomes

- One issue in the collection of data regarding stillbirth is the lack of consistency in formatting of available data<sup>5</sup>
- Improvement in birth outcomes is thought to be due to increased participation in prenatal care activities<sup>2</sup>
- Trends across the literature currently available suggest that interventions that were minimally invasive and simple to implement were most effective in addressing these issues<sup>2,4,5</sup>
- A large study of available data on fetal movement and stillbirth suggested that there is a relationship between fetal movement and stillbirth<sup>6</sup>
- A 50% difference between groups was calculated given the difference in stillbirth rates between women in a previously conducted randomized control trial<sup>9</sup>



**Figure 1:** a photograph taken of the application's user interface. The photo displays the user's ability to count kicks, view data history, and edit their profile.

### Aim

To explore how the use of a mHealth app to prevent stillbirth can improve maternal and fetal pregnancy outcomes.

### Objectives

The primary objectives were:

1. To assess if the app increased awareness of a change in fetal movement, and
2. To evaluate the relationship between app use and birth outcomes (comparison within the sample data and between sample and the population data)

The secondary objectives were:

1. To understand how expectant mothers track their babies movements during pregnancy, and
2. To examine if the app was effective in helping mothers track their babies' movements

### Goals

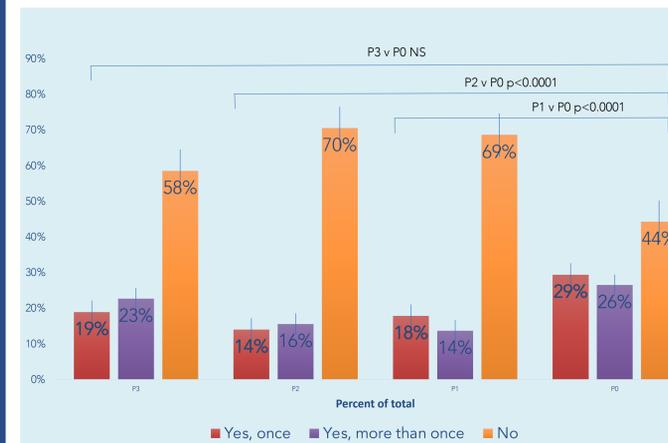
This research aims to contribute to the current body of knowledge surrounding stillbirth outcomes by providing a consistently-formatted, easy to implement survey that will collect data about stillbirth outcomes that can be compared to national averages and trends.

### Methods

- Pilot survey (n =48) followed by survey of app users from 2015-2019 (n = 1463)
- Survey responses were collected in SurveyMonkey<sup>®</sup> and consisted of Multiple choice, yes/no, and open-ended questions.
- A total of 809 women that had previously used the mHealth app completed a self-report survey on their pregnancy outcomes, medical care, experience with the app, and birth outcomes.
- Responses from complete surveys were analyzed by  $\chi^2$  analysis, McNemar test was used for the paired responses.

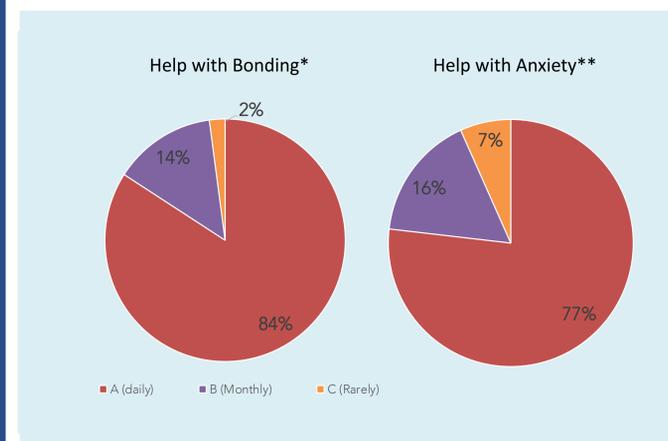
### Results

**Graph 1. Concern about change in baby's movement by pregnancy**



**Graph 1** depicts that women were more likely to be concerned about a change in movement when using CTK app (P0 = pregnancy using mHealth app, P3-P1 = pregnancy not using mHealth app)

**Graph 2. Help with emotional support by tracking frequency**



**Graph 2** shows that regular tracking was associated with feelings of bonding and connection with baby (p<0.0001\*) and feeling less anxious about their baby's health (p<0.0001)\*\*

### Conclusions

- Using an mHealth app to empower mothers to monitor their baby's fetal movement, preliminary research shows the mHealth app increased awareness of a change in fetal movement, and a reduction in stillbirth.
- Use of the mHealth app was associated with reduced anxiety, increased bonding, and greater adherence to clinical kick counting recommendations.
- The results of the study can be applied to stillbirth prevention campaigns and education around mHealth app use during pregnancy.

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