

Making Digital Reproductive Health Interventions Person-Centered & Sustainable

Tamar Krishnamurti, PhD (she/her)
Assistant Professor of Medicine, Clinical & Translational Science
University of Pittsburgh



Conflict of interest

- Co-founder of Naima Health LLC
- Two patents pending related to identifying and remediating risks

The Problem

Current health care delivery models fail to:

- proactively identify people's reproductive needs
- support their autonomy in their own healthcare decision-making
- address preventable adverse outcomes in a patient-centered way

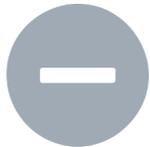
The “Femtech” Opportunity



Pregnancy
Planning &
Prevention



Pregnancy
Wellness

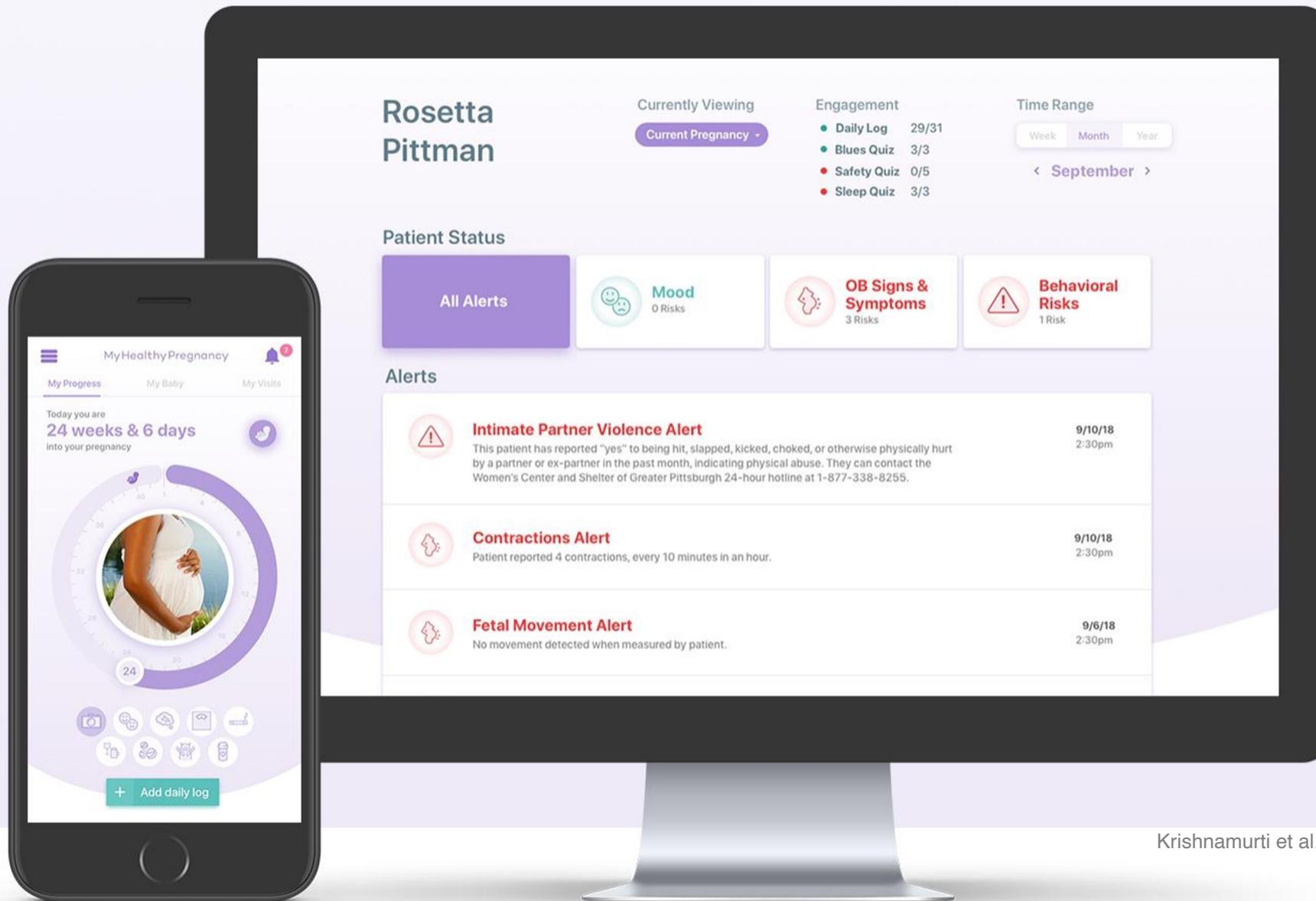


Ending childbearing

Evidence-based patient-facing tools that help people

- navigate preference-sensitive decisions
- mitigate risk for poor reproductive outcomes
- communicate with their providers

...at critical reproductive health junctures



Krishnamurti et al. JMIR mHealth uHealth 2017

Identifies pregnancy risks through **machine learning + clinical best practice screening**

Collects patient entered data for **real time analytics + alerts to a dedicated care team**

Provides patient-centered system and community-based **resources tailored to key risks**

Preeclampsia

- Pre-eclampsia affects approx. 2-8% of pregnancies in the US
- **Preeclampsia is a leading cause of maternal death in the U.S.**
- Low-dose aspirin (75-150 mg/day) appears to be an effective prophylaxis
- Recommended prescription for at least 1 high-risk factor or several moderate-risk factors
 - U.S. Preventative Services Task Force (USPSTF)

See - Ananth, Keyes, Wapner. *BMJ* 2013; Ghulmiyyah, Sibai. *Semin Perinatol* 2012; Askie et al., *Lancet* 2007; Henderson et al, AHRQ Publication No. 21-05274-EF-1; 2021.

Challenges with prevention

1. Appropriate and early identification

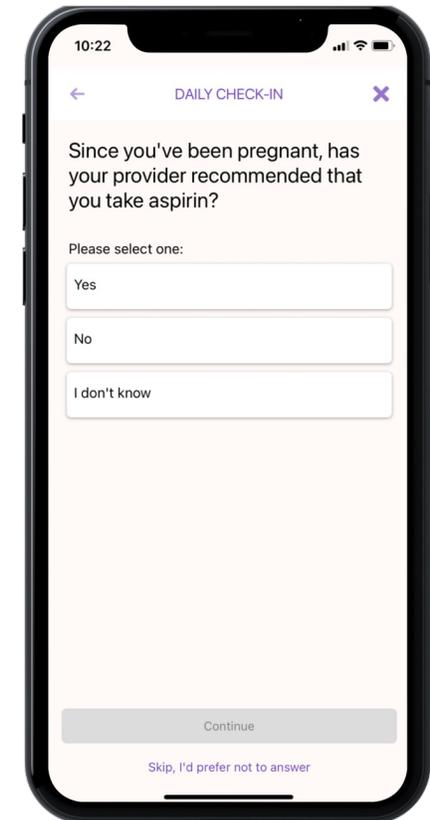
Do high-risk patients receive aspirin?

2. Adequate risk communication

Are those with an Rx aware of it?

3. Adherence to regimen

Do those who acknowledge their Rx adhere to their dose?



10:22

← DAILY CHECK-IN ×

Since you've been pregnant, has your provider recommended that you take aspirin?

Please select one:

Yes

No

I don't know

Continue

Skip, I'd prefer not to answer

Cues & Communication

Do high-risk patients receive aspirin?

Variable	Odds ratio (95% CI)
	Gestation ≤16 wk
High risk	
Pregnancies, No.	1015
Chronic hypertension	14.1 (5.2-38.3)
Prior preeclampsia	12.0 (6.4-22.5)
Type 1 or 2 diabetes	5.8 (2.2-15.2)
Autoimmune disease	3.9 (1.9-8.0)
Kidney disease ^a	0.5 (0.0-6.3)
Moderate risk^b	
Pregnancies, No.	1012
Prior adverse outcomes ^c	3.1 (1.6-6.1)
Obesity ^d	2.3 (1.5-3.5)
Maternal age ≥35 y	1.8 (1.1-3.0)
Nulliparity	2.5 (1.2-5.0)
Identifying as Black or African American	1.9 (1.1-3.5)
Family history of preeclampsia	0.8 (0.4-1.8)
Annual household income <\$25 000	0.8 (0.4-1.3)

Are those with an Rx aware of it?

- 73% of highest risk patients (n=124) had an aspirin recommendation in their chart
- 37% of those with a recommendation were not aware of it

Do they adhere to their regimen?

- About half always adherent

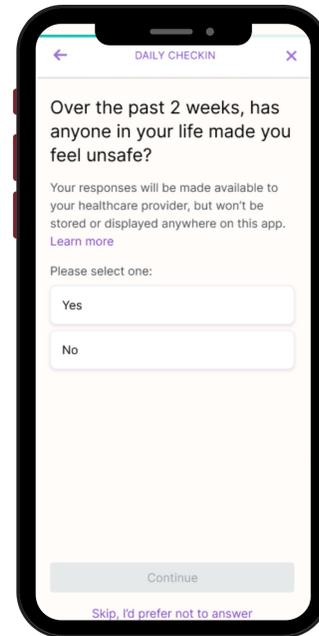
What did we learn?

- Almost complete baseline risk identification, especially for risk factors that may not emerge naturally in a clinical encounter.
- Identified need for clear patient-practitioner communication. Opportunity for ongoing communication about risk and behavior.
- Limitations include missing data – implications for engagement + sustainability

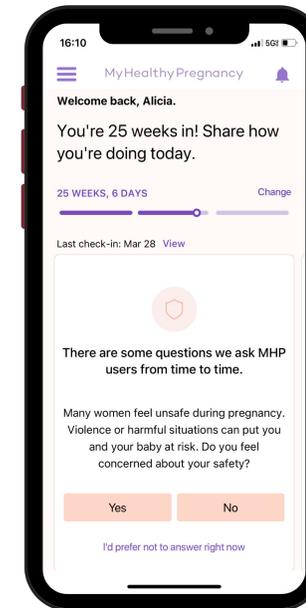
Intimate partner violence

- About 10% of pregnant people experience sexual or physical violence
- **Homicide is a leading cause of maternal death in the U.S.**
- If disclosed, **4x** more likely to receive interventions

Increased touchpoints



Increased Risk Identification



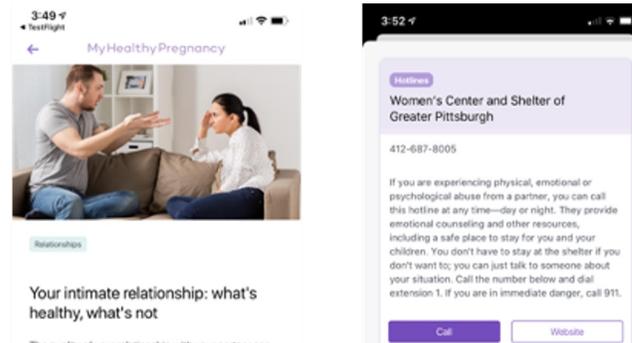
Better Outcomes

JOURNAL OF MEDICAL INTERNET RESEARCH
Krishnamurti et al
Original Paper

Mobile Remote Monitoring of Intimate Partner Violence Among Pregnant Patients During the COVID-19 Shelter-In-Place Order: Quality Improvement Pilot Study

Tamar Krishnamurti¹, PhD; Alexander L Davis², PhD; Beth Quinn³, RNC; Anabel F Castillo⁴, PhD; Kelly L Martin⁵, RNC; Hyagriv N Simhan⁶, MSc, MD

Earlier connection to resources



What did we learn?

- Digital tools serve as a safe space to disclose, learn - *sometimes*
- Sometimes less is more with personalized medicine
- Identify gaps in care

Potential Pitfalls

- A supplement not a solution
- Privacy and exploitation
- Exacerbate inequities through algorithms, content, dissemination...

Guiding Principles

- Ground content in evidence-based science
- Advance health equity
- Center the needs and preferences of those seeking care
- Support patient autonomy in managing their care
- Incorporate community stakeholders as partners
- Check yourself

Funding



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Sonya Borrero, MD, MS
School of Medicine
University of Pittsburgh



**Marian Jarlenski, PhD,
MPH**
Graduate School of
Public Health
University of Pittsburgh



Raelynn O'Leary, MDes
School of Design
Carnegie Mellon University



Ashley Deal, MDes
School of Design
Carnegie Mellon University



**Marielle Gross, MD
OB/GYN**
UPMC



Traci Kazmerski, MD, MS
School of Medicine
University of Pittsburgh



Tamar Krishnamurti, PhD
School of Medicine
University of Pittsburgh



**Mehret Birru Talabi, MD,
PhD**
School of Medicine
University of Pittsburgh



Lisa Callegari, MD, MPH
School of Medicine
University of Washington



Elizabeth Mosely, PhD
School of Medicine
University of Pittsburgh