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Practice Summary & Implementation Guidance

PowerMom First

This study investigates the relationship between systemic racism and poor maternal health outcomes in Black and Hispanic pregnant people.

Cutting-Edge	Emerging	Promising	Best

Location	Topic Area	Setting
California	Health Equity; Mental Health/Substance Use	Home-based

Population Focus	NPM	Date Added
Women/Maternal Health	Low-Risk Cesarean Delivery, Risk-Appropriate Perinatal Care, Breastfeeding, Safe Sleep, Smoking-Pregnancy	January 2022

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PRACTICE DESCRIPTION

In the US, maternal mortality remains unacceptably high in contrast to other developed nations. Black and Hispanic pregnant people are several times more likely to experience maternal morbidity and mortality. While structural racism and discrimination (SRD) significantly contributes to devastating inequities, inadequate information exists to quantify the direct correlation of structural and individual level racism to health outcomes. Identifying the broad impact of SRD on pregnancy and insight into the domains of influences on maternal child health outcomes is urgent. Via an extensive and diverse database which includes biometric data collected from wearable sensors, PowerMom FIRST (**F**ighting **I**nequity & **R**acism with **S**upportive **T**echnology) is uniquely positioned to establish the crucial relationship between SRD and maternal-fetal-child health outcomes.

PowerMom is a well-established bilingual (Spanish and English) application (app)-based, user-centric research platform that serves as a database for a range of valuable longitudinal health data throughout pregnancy. It was relaunched with input from a participant advisory board and includes baseline surveys plus maternal-fetal-child health outcome data. Given the complex, multi-faceted, and intersectional influence of SRD on disparities in health outcomes, we utilized the NIMHD Research Framework to design PowerMom FIRST. PowerMom FIRST leverages and expands the existing research platform to collect data relative to the multidimensional impact of SRD experienced by Black and Hispanic pregnant people in California (CA). We administer validated, individual survey instruments to assess health and well-being in the context of health inequities, disproportionate health outcomes, and relevant factors that influence maternal health. Biometric data evaluating the body's impact when experiencing SRD (activity level, stress, sleep quality, breathing rate, and stress management scores) is captured by the mobile app. The wealth of data on experiences and outcomes via the app will be analyzed in conjunction with SRD data collected by zip code regarding community policing, law enforcement, societal views, community infrastructure, healthcare access, and neighborhood segregation/redlining within CA. Enrollment of 1000 diverse pregnant persons and collection of CA data by zip code will be done in partnership our current and growing network of community partners and advocacy groups working with mothers from marginalized communities. The PowerMom FIRST research team is led by Dr. Toluwalase (Lase) Ajayi, a community pediatrician and clinical researcher who brings professional, medical, and lived experiences in service of the PowerMom FIRST mission and goals. Dr. Ajayi is supported by a team inclusive of an obstetrician-gynecologist and a sociologist dedicated to researching disparities and researchers experienced in all aspects of implementing and deploying digital research studies, including participant enrollment, data collection, return of information, and advanced methodologies and analytics. The long-term goal of PowerMom FIRST is to refine and apply these advanced methods assessing the multidimensional impact of SRD on maternal-fetal-child health on a national level with the ability to be inclusive of other marginalized populations. We hypothesize that there is a direct relationship between the various pathways through which the lived experience of SRD impacts health, and the health inequities seen in maternal, fetal, and child outcomes for Black and Hispanic pregnant people in California.

CORE COMPONENTS & PRACTICE ACTIVITES

The goal of our program is to collect information on how structural racism affects the pregnancy journey within pregnant people in California. To do this, we plan on collecting individual biometric and survey data focused on the person-level influence of SRD in California using the PowerMom Research Platform. Working with our community partners, we will recruit 1000 participants (400 Black, 400 Hispanic, with a control group of 200 Non-Hispanic White) to PowerMom FIRST, then utilize the mobile platform to deploy validated surveys on the lived experience of SRD. By coupling the stated accounts of lived experiences of SRD with the biometric body impact data and the baseline PowerMom surveys, we will capture the first comprehensive collection of information on the individual experience of SRD for pregnant persons. We also aim to identify associations between individual-level and community-level data of the experience of SRD on maternal-fetal-child health outcomes. We collect data on community policing, law enforcement, community infrastructure, healthcare access, and neighborhood segregation/redlining, to better situate and understand the individual-level experience and impact based on community-level factors of SRD.

Core Components & Practice Activities		
Core Component	**Activities**	**Operational Details**
Enrollment	PowerMom Research Platform	The technology supporting the PowerMom app allows for newly pregnant people, and those who recently delivered, to enroll and participate in the study anytime and anywhere and connect to their electronic health records. The app provides off-the-shelf functionalities for participants to capture and share health information, visualize their data, see trends over time, and provide researchers with observations informed by real-world evidence.
Maternal Health Surveys	Assessment of health throughout course of pregnancy	Surveys include demographic data (e.g., race, ethnicity, education), baseline health history survey specific to general maternal health information (e.g., number of pregnancies and births, access to healthcare providers, known conditions/disorders, etc.). A bi-weekly survey for entry of current vitals (weight, blood pressure, heart rate), new or persistent pregnancy-related symptoms, and any health behavior changes related to drug, alcohol, or tobacco use. Additional surveys include a delivery survey (based on projected due date or as triggered by participant) and a postpartum survey (6-8 weeks after delivery), which includes mental-health-related questions.
Biometric Data	Assessment of biometrics through connected sensors	Body impact data collected from the FitBits will include the stress management score, total daily

		activity, total daily steps, HRV, HR, total time asleep, and time spent in various sleep stages.
Structural racism and discrimination (SRD)	Assessment of self-reported SRD through bi-weekly and bi-monthly surveys	Racist Societal Views, Community infrastructure/ Neighborhood segregation, HealthCare Access, Community Policing/Law Enforcement

HEALTH EQUITY

PowerMom FIRST addresses weaknesses of prior research and current knowledge gaps by actively engaging Black and Hispanic pregnant people in a longitudinal study utilizing a participant-forward digital research platform. There remain extensive knowledge gaps in describing the association of SRD and adverse pregnancy outcomes, in large part due to the historical underrepresentation of minoritized individuals and exclusion of pregnant persons in clinical research. Importantly, by utilizing a digital research platform, PowerMom allows participants to enroll at their convenience, thereby overcoming time commitment and work absenteeism barriers while providing a resource for health information and advocacy which imparts a sense of control, an investment in the outcome, greater trust, and tangible, real-time value to the participant in the form of knowledge and connection to their data. The data thereby obtained will ensure a robust and patient-centered approach to understanding how structural racism impacts maternal-fetal-child health.

EVIDENCE OF EFFECTIVENESS

The original PowerMom pilot study launched in 2017 and enrolled over 3500 patients in two years. Participants in the study consisted of 15% from rural zip codes, 25% non-white, and 50% overweight or obese. The pilot study collected 14,000 unique physiologic data points through a smartphone enabled direct-to- participant research platform. We were able to collect detailed data on a frequent basis without in-person clinic visits. Our team has since expanded the program to focus on the impacts of SRD on maternal health and is actively enrolling participants in the research study. As we have relaunched our platform to directly address health inequities in this population, we have been able to grow our consortium of partners who are ready to work with us and grow our participants. The Power of PowerMom comes from our participant partners, as we continue to engage more participants into PowerMom we will be able to enroll more into PowerMom first and accomplish our goals.

COLLABORATORS AND PARTNERS

Practice Collaborators and Partners		
Partner/Collaborator	**How are they involved in decision-making throughout practice processes?**	**Does this stakeholder have lived experience/come from a community impacted by the practice?**
Black and Hispanic pregnant people and mothers	To learn from their experiences of lived SRD and their experiences with pregnancy, and input to improve our research platform.	Yes, Black and Hispanic pregnant people are active participants in PowerMom and help inform the work being done to study SRD and its impact on pregnancy outcomes. We also have a patient advisory group that will help iteratively improve, scale, and expand PowerMom FIRST to the national level after the successful implementation in the large and heterogeneous state of California.
Advisory Panel of OB/GYNS	To work with and learn from experts in the field of Obstetrics and Gynecologists who are dedicated to addressing health disparities in maternal fetal health. They help inform our protocols and ensure that our work is guided by appropriate clinical guidelines.	Yes, Obstetrics (the OB) involves care during pre-conception, pregnancy, childbirth, and immediately after delivery. Gynecologists (the GYN) provide care of all women's health issues. Working with these caregivers who specialize in promoting health equity for all patients in their clinical research and practice is essential to making sure that our protocols are clinically sound.
March of Dimes	MOD supports people throughout their pregnancy and advocates for policies that prioritize their health.	Yes, MOD supports radical improvements to the care that pregnant people receive and they pioneer research to find solutions to the biggest health threats to pregnant people and babies.
African American Wellness Center for Children and Families	Their aim is to create a world where African American families and other underserved people can reach their highest potential and wellbeing.	Yes, they represent a key community that PowerMom aims to serve and learn from.

Happy Mama Healthy Baby Alliance	They design community-based initiatives and strategies, engage and mobilize stakeholders to improve maternal and child health.	Yes, they work with Dulas and midwifes who work directly with under represented minorities in the Los Angeles area. They help provide the perspective of midwifes and Dulas as well as inform our recruitment strategies as well as the overall aims of the program.
Blue Cross Blue Shield Association	BCBSA is taking action to address racial health disparities and has partnered with us to do outreach to providers and patients.	Yes, BCBSA works with a diverse population of people and is specifically working on addressing health disparities in maternal health.

REPLICATION

This practice has not yet been replicated. However, we are working on a separate study that will focus on maternal mental health and in the future will be exploring disease-specific areas like gestational diabetes and preeclampsia.

INTERNAL CAPACITY

Staff Scientist, Epidemiologist and Clinical Researcher, PhD (effort = 1.20 cal months, Years 1-3; 7.10 cal months, year 4) Expertise in digital medicine, infectious diseases, and maternal health, as well as research methodologies and biostatistics. Dr. Radin also serves as Principal Investigator on another national-scale digital. This position will assist in the analyses and modeling and help interpret, summarize, and translate the research findings.

Biostatistician, **MD** (effort = 1.0 cal month year one; 2.2 cal month years 2-3; 3.6 cal months year 4). Specialty in Preventative Medicine and provides expert biostatistical guidance in all aspects of clinical research study design. This individual leads the effort on the biostatistical analysis of data collected.

Data Scientist, PhD (effort = 0.3 cal months, Years 1-3; 1.2 cal months year 4) The Data Scientist has expertise in machine learning, artificial intelligence, wireless wearable sensors and large physiological dataset analysis. He will help oversee the optimization and refinement of existing platforms for data aggregation, management and sharing that assures the highest possible levels of security and privacy. He will also interface with all technology partners to allow for seamless transference of data.

Data Scientist (effort = 1.2 cal months, years 1-4) This second data scientist will maintain our data integrity, and assisting with cleaning and managing the data collected with this study, including tracking missed data.

Sr. Product Manager, MS (effort = 1.8 cal months, Years 1-3) This individual has working experience on different areas of digital product development, including product management, software engineering, user experience design, user research, and quality assurance. For PowerMom, they will translate our research goals for the PowerMom FIRST study into product requirements and will lead our digital design strategy. They will also lead the UX/UI work for the participant facing components of the PowerMom FIRST study including data visualization of individual trends.

Project Manager, BS (effort = 4.80 cal months, Years 1-4) This individual has expertise in Good Clinical Practice and a specialization in mobile health and patient engagement. The project manager works with the PowerMom team to help implement recruitment and retention strategies, assist in development of web platforms, collaborate with staff scientists to create study databases, lead project team meetings, and prepare study communications for the pilot programs. In addition, they are a talented and experienced manager of personnel and will lead organizational planning for the PowerMom team and implement and maintain systems of performance management and improvement. The PM also provides expertise in the implementation and patient-centered design for the study.

Project Coordinator (effort = 6.0 cal months, Years 1-3; 3.0 cal months, Year 4) This individual has experience in clinical research in the field of Maternal and Fetal Medicine. They have extensive expertise developing new surveys within the app-based platform. They will lead the implementation of the additional discrimination and social determinants of health surveys and integrate previously developed health and wellness surveys. They will also be responsible for managing chat, email, and phone-based conversations with participants and will assist in managing project team meetings and project roadmaps.

Project Coordinator (effort = 6.0 months, Years 1-3; 3.0 cal months Year 4) This second PC is fluent in Spanish and English and is skilled and experienced in participant engagement. They will be working with the study PI in the development of participant communications and help with translation services. They will also be working with the Project Manager to implement recruitment and retention strategies and be in direct contact with study participants through the completion of the study. This PC will be responsible for managing chat, email, and phone-based conversations with participants in Spanish.

Principal Investigator, MD (effort = 4.20 cal months, Years 1-4) The PowerMom PI is a board-certified pediatrician and is the Director of Clinical Research & Diversity Initiatives in Digital Medicine at the Scripps Research Translational Institute (SRTI) San Diego where she directs and oversees clinical research for the institute pertaining to new wearables, mobile health apps, and other digital health technologies as well as broadening DEI initiatives to refocus on equity and inclusion for all. She brings with her expertise from serving on the Pediatric Operations Task Force and on the Digital Health Technologies committee of the *All of Us* Research Program with the National Institutes of Health. The PI supervises the project including experimental design, data interpretation, quality control, manuscript preparation and annual reports.

Sr. Director Strategic Initiatives, MBA (effort = 0.60 cal months, Year 1; 0.30 cal months Year 2-3) The director leads strategic initiatives for Scripps Research Translational Institute (SRTI). She has over 12 years of experience managing research projects. These research projects have leveraged insights from behavioral economics and other social sciences to improve clinical trial enrollment, increase the return on incentive schemes, identify effective communication, programs, and improve patient and participant outcomes. This position will be responsible for overseeing all outreach and retention efforts.

PRACTICE TIMELINE

For more information on this practice's timeline and specific practice activities, please contact Lauren Ariniello directly at laurena@scripps.edu.

PRACTICE COST

Budget			
Activity/Item	**Brief Description**	**Quantity**	**Total**
Salary & Wages	Principal Investigator	1 - Part-time	$78K/year
	Staff Scientist, Epidemiologist	1 - Part-time	$14K/year
	Data Scientist	1 - Part-time	$5K/year
	Biostatistician	1- Part-time	$12K/year
	Director Strategic Initiatives	1- Part-time	$13K/year
	Product Manager	1- Part-time	$29K/year
	Project Manager	1- Part-time	$39K/year
	Project Coordinator	2 - Part-time	$84K/year
	Data Scientist	1- Part-time	$11K/year

	Consultant	1 - Part-time	$3K/year
Technology Partner	App implementation		$40K/year
Data visualization software	Fitabase		$10.5K/year
Device Distribution	Fitbit and Aria Scale shipment		$10.5K/year
Outreach Campaigns	Social media ads and other strategic campaigns		$20K/year
Outreach Partners	Kavita Arora (UNC) and Physicians for a Healthy California		$118K/Year
		Total Amount:	**$ 487,000**

LESSONS LEARNED

We have learned many lessons during the course of this work. One key lesson is the importance of including the relevant stakeholders in our study design and implementation. We worked closely with our community partners and participant advisory board during the development of the upgraded PowerMom platform and in designing the PowerMom FIRST study and regularly updating and improving our general PowerMom study platform. Our participant advisory board was consulted when creating the in-app notifications so that they would be effective, yet not burdensome. The research platform allows us to receive and incorporate feedback from the study participants to assist in retention. We also worked with our community and participant partners to evaluate the length of time required to complete each survey and selected validated surveys confirmed to require no more than 15 minutes to complete. Because this study is digital, participants have several weeks to complete their surveys before the next one is due, therefore can complete at their leisure.

Challenges: In the initial pilot study, there was a 50% completion of outcome surveys. We didn't provide any in-app notifications or direct participant engagement. With the help of our participant advisory board, we've fine-tuned our retention strategies to make sure we are engaging more frequently with pregnant people in the program.

NEXT STEPS

Foundational in our outreach approach is ensuring that we are establishing trust with our participants. We will expand our efforts to network and outreach with local healthcare organizations allowing for a community-based recruitment approach that will complement a larger multi-touch, bilingual campaign (e.g., email, mailers, social media campaigns, in-app nudges). As we rapidly build our participant base, we can work to push out insights to our current participants. We have connections with organizations that have strong partnership with physicians and patients from diverse communities. We will expand out reaching by working with our expanding network of partners to distribute collateral materials via emails, social media posts and ads (ie LinkedIn, Facebook, Instagram), as well as postings on partner organization websites, etc.

As we grow and secure more funding, we hope to be able to provide monetary incentives to our participants and our advisory boards to show our appreciation for their time and help. As mentioned above, once we reach our critical mass of participants, we will be able to push out learned insights directly to our participants. We also hope to include more wearable technologies for our participants and gather enough data to develop predictive analytics and anticipate persons in our studies at risk of poor outcomes. We hope to work Policy makers and share our results to that we can change how certain aspects of maternal care is reimbursed and provided to pregnant and post-partum people and their newborns. We hope to continue to work with other clinical researchers who may have interventions that they want to incorporate into our platforms that will directly benefit our participants and our goal of reducing disparities in this population.

APPENDIX

- Everyday Discrimination Scale ((PMID: 30894420, PMID: 31121440, PMID: 16005789)

- PhenX Tool Kit Surveys: Neighborhood Collective Efficacy (PMID: 22493683); Neighborhood Safety (PMID: 17329713, PMID: 26356735); Physical Activity Neighborhood Environment (PMID: 19460656)

- Heightened Vigilance Scale ((PMID: 25247925)

- Other Survey Questions:

  Screening Questions

  1. Are you age 16 or older?
     Yes
     No
  2. Do you live in the United States of America?
     Yes
     No
  3. Can you read and write in English or Spanish?
     Yes
     No
  4. Are you currently pregnant?
     Yes
     No
  5. How many weeks pregnant are you? (If you are unsure, please skip this question)
     (Text option for Weeks and Days)

6. Have you delivered a baby in the last eight (8) weeks?
   Yes
   No

If you answered "Yes" to all of the above questions 1-4, or Answered "Yes" to question 6, you are eligible to join the POWERMOM study. Please tap the button below to begin the consent process.

Study Consent Screens

Intake Survey

1. Do you know your due date? *If participant answers, "Yes," go to question 2. If not, skip 2.
2. What is your due date?
3. How many babies are you having? Number choice option
4. Please select the following race and/or ancestry that define you best. (Check all that apply)
   0. American Indian or Alaskan Native (For example: Aztec, Blackfeet Tribe, Mayan, Navajo Nation, Native Village of Barrow (Utqiagvik), Inupiat Traditional Government, Nome Eskimo Community, etc.)
   1. Asian (For example: Asian Indian, Chinese, Filipino, Japanese, Korean, Vietnamese, etc)
   2. Black/African American/African (For example: African American, Ethiopian, Haitian, Jamaican, Nigerian, Somali, etc)
   3. Hispanic, Latino, or Spanish (For example: Columbian, Cuban, Dominican, Mexican or Mexican American, Puerto Rican, Salvadoran, etc.)
   4. Middle Eastern or North African (For example: Algerian, Egyptian, Iranian, Lebanese, Moroccan, Syrian, etc)
   5. Native Hawaiian or other Pacific Islander (For example: Chamorro, Fijian, Marshallese, Native Hawaiian, Tongan, etc)
   6. White (For example: English, European, French, German, Irish, Italian, Polish, etc)
   7. None of these options fully describe me
   8. Prefer not to answer
5. Father's race (Check all that apply)
   0. American Indian or Alaskan Native (For example: Aztec, Blackfeet Tribe, Mayan, Navajo Nation, Native Village of Barrow (Utqiagvik), Inupiat Traditional Government, Nome Eskimo Community, etc.)
   1. Asian (For example: Asian Indian, Chinese, Filipino, Japanese, Korean, Vietnamese, etc)
   2. Black/African American/African (For example: African American, Ethiopian, Haitian, Jamaican, Nigerian, Somali, etc)
   3. Hispanic, Latino, or Spanish (For example: Columbian, Cuban, Dominican, Mexican or Mexican American, Puerto Rican, Salvadoran, etc.)
   4. Middle Eastern or North African (For example: Algerian, Egyptian, Iranian, Lebanese, Moroccan, Syrian, etc)
   5. Native Hawaiian or other Pacific Islander (For example: Chamorro, Fijian, Marshallese, Native Hawaiian, Tongan, etc)
   6. White (For example: English, European, French, German, Irish, Italian, Polish, etc)
   7. None of these options fully describe me
   8. Prefer not to answer
6. What is the highest degree or level of school you have completed? If currently enrolled, highest degree received.
   0. Some high school, no diploma-Not graduated high school
   1. High school graduate or the equivalent (for example: GED)
   2. Trade/technical/vocational training
   3. Associate /Bachelor's degree

4. Master's degree or higher
7. Enter your zip code
8. Enter your height (please enter feet and inches)
9. How much did you weigh before you got pregnant?Enter your current weight (please enter in pounds)

Health History Survey

1. How many pregnancies have you had?
2. How many times have you given birth?
3. Have you seen a health care professional since becoming pregnant?
    0. Yes
    1. No
4. What type of care provider are you seeing for your prenatal care? If you are seeing multiple providers, check all that apply.
5. Which method of transportation do you use to get to your healthcare provider?
    0. Car
    1. Public Transportation (Bus, Train, etc.)
    2. Walking
    3. Biking
    4. A friend drove me
6. On average, how long does it take you to travel to your healthcare provider? (in minutes)
7. How many ultrasounds have you had so far during this pregnancy?
8. How did you get pregnant during this pregnancy?
    0. Intercourse/Sex
    1. In Vitro Fertilization
    2. Ovulation Drugs
    3. Intrauterine Insemination (IUI)
9. Are you currently taking any medications or supplements (including prenatal vitamins)?
    0. Yes
    1. No
1. List current medications (over-the-counter, prescription, supplements)
2. Are you currently being treated for anxiety or depression?
    0. No
    1. Yes, for depression
    2. Yes, for anxiety
    3. Yes, for both
3. Have you, the baby's father, or anyone in either family ever had any conditions/diseases diagnosed when they were a baby or early childhood?
    0. Yes
    1. No
4. Please select known Conditions/Disorders: *Question only shown if participant answers "Yes" to the question above
    0. Blindness/Early onset vision loss
    1. Cleft lip and or Cleft Palate
    2. Cystic Fibrosis
    3. Deafness/ Early onset hearing loss
    4. Down Syndrome
    5. Heart Defect at Birth
    6. Huntington Chorea
    7. Neural Tube defect, Spina Bifida (open spine), Anencephaly
    8. Tay-Sachs

9. Thalassemia
10. Sickle Cell Disease or Trait
11. Hemophilia or other Blood Disorder
12. Muscular Dystrophy
13. Phenlyketonuria
14. Other chromosomal or genetic disorder
15. None of these
16. I don't know

5. Before you were pregnant, were you diagnosed with any of the following diseases? Please check all that apply.
   0. Heart Disease
   1. Covid-19
   2. Eating disorder
   3. Endometriosis or PCOS
   4. Hypertension (High Blood Pressure)
   5. Kidney Disease (Renal Disease)
   6. Lupus
   7. Sexually Transmitted Infection
   8. Type I Diabetes
   9. Type II Diabetes
   10. Other (Space to free text)
   11. None of the above

6. Did you have any complications in your past pregnancy/pregnancies? *Question 15 and 16 are only shown to participants that indicated being pregnant > 0 times
   0. Yes
   1. No

7. Please select all conditions that developed in past pregnancies.
   0. Gestational diabetes
   1. High blood pressure
   2. Low birth weight
   3. Placenta Previa
   4. Preeclampsia
   5. Pregnancy loss/miscarriage
   6. Preterm birth/Early birth of baby
   7. Other
   8. None of the above

Bi-Weekly Survey

1. During the past 2 weeks, did you see a healthcare professional for a pregnancy related reason?
   0. Yes
   1. No
2. Did you receive an ultrasound at your appointment?
   0. Yes
   1. No
3. Please record any measurements that were taken at your appointment.
   0. Numeric Choices for Blood Pressure (Top Number)
   1. Blood Pressure (Bottom Number)
   2. Weight (pounds)
   3. Heart Rate (beats per minute)

4. Please record any measurements that you took yourself (at home, at a pharmacy, etc.)
    0. Numeric Choices for Blood Pressure (Top Number)
    1. Blood Pressure (Bottom Number)
    2. Weight (pounds)
    3. Heart Rate (beats per minute)
5. Were you diagnosed with any conditions at your most recent prenatal visit?
    0. Yes
    1. No
2. Please check all conditions or illnesses that apply.
    0. Cold/Flu
    1. Covid-19
    2. Gestational Diabetes
    3. Hypertension (High Blood Pressure)
    4. Mouth or Tooth Disease
    5. Preeclampsia
    6. Sexually Transmitted Infection (STI)
    7. Small baby (IUGR)
    8. Big baby (macrosomia)
    9. Placenta Previa/Placental Complication
    10. Strep (Group B Positive)
    11. Other
    12. Other conditions: (free text choice)
3. During the past 2 weeks, did you experience any of the following symptoms?
    0. Nausea and/or Vomiting
    1. Stomach Cramping and/or Abdominal Pain
    2. Vaginal Spotting or Bleeding
    3. Body Aches
    4. Changes in Vision
    5. Cough
    6. Dizziness
    7. Fatigue
    8. Fever
    9. Severe Headache
    10. Shortness of breath
    11. Sore Throat
    12. Swelling of the feet, hands, or face
    13. None of the above
4. How often did you experience Nausea and/or vomiting in the past 2weeks?
    0. Once
    1. Several times a day
    2. Several times a week
5. How often did you experience stomach cramping or pain in the past 2 weeks
    0. Once
    1. Several times a day
    2. Several times a week
6. Have you changed any medications you are currently taking (including over the counter, prescription, and supplements)?
    0. Yes
    1. No
7. List updated medications: (Choice search text)

8. During the past 2 weeks, did you:
    0. Drink alcohol
    1. Smoke/chew tobacco
    2. Smoke/Ingest marijuana
    3. Smoke other
    4. Vape
    5. Take an illegal drug
    6. None of the above

Bi-Monthly Survey (Initial)

1. After you give birth, what type of birth control do you plan on using? (check all that apply)
    0. Abstinence
    1. Breast Feeding
    2. Birth Control implant
    3. Birth Control injection (eg. Depo)
    4. Birth Control Patch
    5. Birth Control Pill/Mini Pill
    6. Birth Control Vaginal Ring
    7. Condoms or other barrier method
    8. IUD
    9. Sterilization (you) eg tubal ligation
    10. Sterilization (your partner) eg vasectiomy
    11. None
    12. Other
2. Other birth control option: (Free text) *Only appears if one of the selected answers to question above is "Other"
3. Who is helping/supporting you during the pregnancy/after baby is born? (check all that apply)
    0. Partner/spouse
    1. Family
    2. Friends
    3. No one
    4. Other
4. Support Plan: (Free text) *Only appears if one of the selected answers to question above is "Other"
5. How do you plan on feeding your baby? (Check all that apply)
    0. Breast milk by nursing
    1. Breast milk by bottle
    2. Formula by bottle

Bi-Monthly Survey Follow Up

1. Has your plan for birth control changed since the previous survey?
    0. Yes
    1. No
2. After you give birth, what type of birth control do you plan on using? (check all that apply)
    0. Abstinence
    1. Breast Feeding
    2. Birth Control implant
    3. Birth Control injection (eg. Depo)
    4. Birth Control Patch
    5. Birth Control Pill/Mini Pill
    6. Birth Control Vaginal Ring

7. Condoms or other barrier method
8. IUD
9. Sterilization (you) eg tubal ligation
10. Sterilization (your partner) eg vasectiomy
11. None
12. Other

3. Other birth control option: (Free text) *Only appears if one of the selected answers to question above is "Other"
4. Has your plan for support changed since the previous survey?
   0. Yes
   1. No
5. Who is helping/supporting you during the pregnancy/after baby is born? (check all that apply)
   0. Partner/spouse
   1. Family
   2. Friends
   3. No one
   4. Other
6. Support Plan: (Free text) *Only appears if one of the selected answers to question above is "Other"
7. How do you plan on feeding your baby? (Check all that apply)
   0. Breast milk by nursing
   1. Breast milk by bottle
   2. Formula by bottle

Delivery Survey – we will remind users who have not submitted outcomes 4 weeks after their due date to come back to the app to complete the delivery survey.

Notification message: POWERMOM Study: You're almost finished! Please answer these questions to complete your participation in the study.

1. How did you complete your pregnancy? *Participants will be sent to an early exit screen if they select answer choice "B" or "C." All participants who select choice "A" will continue to rest of survey
   0. I gave birth.
   1. I experienced a stillbirth
   2. The pregnancy ended.
2. How many babies did you give birth to? (Numeric Choice)
3. Please enter the birth date of your baby/babies. (Date answer choice)
4. Baby Information Form *Will repeat for number of babies indicated in Question 2.
   - What is the sex of your baby?
     o Male
     o Female
   - Baby's Length (inches)
   - Baby's Weight (Pounds)
   - Baby's Weight (Ounces)
1. Delivery Information Form
   - What type of delivery did you have?
     o Spontaneous Vaginal Delivery
     o Vaginal after C-Section
     o Planned C-section
     o Unplanned C-section
     o Vacuum Extraction
     o Forceps Delivery

- Was your labor induced?
  - Yes
  - No
- Did you have an epidural?
  - Yes
  - No

1. Where did the birth take place?
   0. Hospital
   1. Non-hospital birthing center
   2. Home
   3. Other
2. Please indicate where you gave birth. (Free Text Choice) *Option only shown if "Other" is selected above
3. How are you currently feeding your baby? (Check all that apply)
   0. Breast milk by nursing
   1. Breast milk by bottle
   2. Formula by bottle
4. Check all the boxes next to all vaccines you've received in the last year
   0. Flu (influenza)
   1. COVID-19
   2. Tdap (Tetanus, Diphtheria, & Pertussis)
   3. Hepatitis B
   4. MMR
   5. Meningitis
   6. Pneumonia
   7. HPV
   8. Other
   9. None
5. Please indicate how many doses of the Covid-19 Vaccine you have received.
   (Numeric Choice: 1 or 2)
6. Please indicate which Covid-19 Vaccine you received
   a. Pfizer
   b. Moderna
   c. J&J
7. Other vaccines received during pregnancy: (Free Text Choice) *Only show to participants that selected "Other" option in Question 9

Postpartum Questionnaire (6-8 weeks after delivery)

1. How do you feel your baby is sleeping?
   0. Too much
   1. Too Little
   2. Just right
   3. I don't know
2. How much sleep are you getting?
   0. Too much
   1. Too Little
   2. Just right
3. Have you had any fevers since you delivered?
   0. Yes
   1. No

       2. I don't know
4. Are you still having Vaginal Bleeding?
       0. Yes
       1. No
5. How much Pain are you in? 0 being none and 10 being a lot (Scale Answer from 0-10)
6. Are you and your partner having sex? Please check all that apply.
       0. Yes, vaginal
       1. Yes, oral
       2. Yes, other
       3. No
7. Have you taken your baby to the Doctor since you delivered?
       0. Yes- For a routine weight check
       1. Yes- For a baby's first well child check
       2. Yes- My Baby had a fever
       3. Yes- My baby was sick
       4. No
8. Is your baby gaining weight well?
       0. Yes
       1. No
       2. I don't know
9. Has your baby received all the vaccines the pediatrician recommended?
       0. Yes
       1. No
       2. Some of them
10. What type of birth control are you using? (check all that apply)
       0. Abstinence
       1. Breast Feeding
       2. Birth Control implant
       3. Birth Control injection (eg. Depo)
       4. Birth Control Patch
       5. Birth Control Ring
       6. Condoms or other barrier method
       7. IUD
       8. Oral Contraception Pill
       9. Progestin only Pill
       10. Sterilization (either you or your partner)
       11. None
       12. Other
11. Birth control method: (Free text box)
12. Who is helping you care for your baby? Please check all that apply.
       0. Partner/spouse
       1. Family
       2. Friends
       3. No one
       4. Other
13. Support system: (Free text box)
14. How are you feeding your baby? Please check all that apply.
       0. Breast milk by nursing
       1. Breast milk by bottle
       2. Formula by bottle

Postpartum Mental Health Survey

Please select the best answer that describes how you have felt in the last 7 days.

1. I have been able to laugh and see the funny side of things.

   0. As much as I always could
   1. Not quite so much now
      Definitely not so much now
   2. Not at all

2. I have looked forward with enjoyment to things.

   0. As much as I always could
   1. Not quite so much now
      Definitely not so much now
   2. Not at all

3. I have blamed myself unnecessarily when things went wrong.

   0. No, never
   1. Not very often
       Yes, some of the time
   2. Yes, most of the time

4. I have been anxious or worried for no good reason.

   0. No, never
   1. Not very often
   2. Yes, some of the time
   3. Yes, most of the time

5. I have felt scared or panicky for no good reason.

   0. No, never
   1. Not very often
   2. Yes, some of the time
   3. Yes, most of the time

6. Things have been getting to me recently.
   a. No, I have been coping well as ever
   b. No. most of the time I have coped quite well
   c. Yes, sometimes I haven't been able to cope at all
   d. Yes, most of the time I haven't been able to cope at all

7. I have been so unhappy that I have had difficulty sleeping

   0. No, never
   1. Not very often
   2. Yes, some of the time
   3. Yes, most of the time

8. I have felt sad or miserable.

   0. No, never
   1. Not very often

2. Yes, some of the time
3. Yes, most of the time

9. I have been so unhappy that I have been crying.

   0. No, never
   1. Not very often
   2. Yes, some of the time
   3. Yes, most of the time

10. The thought of harming myself has occurred to me

    0. Never
    1. Hardly ever
    2. Sometimes
    3. Quite often

Thank you for your participation in POWERMOM. Your data has helped improved pregnancy health knowledge. If you would like to provide feedback, please email us at powermom@scripps.edu