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Approval Sheet

The Development of Sexual and Reproductive Health Content for *In The Know* Mobile Health App

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Abstract Cover Page

The Development of Sexual and Reproductive Health Content for *In The Know* Mobile Health App

By

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Bachelor of Arts
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Clemson University 2018

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2021

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An abstract of

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Abstract

The Development of Sexual and Reproductive Health Content for *In The Know* Mobile Health App

By Charity Shaw

Background: Black women in the United States face higher rates of sexually transmitted infections, HIV, infant and maternal mortality, unintended pregnancies, and pregnancy-related complications. Increased access to mobile technology among low-income communities has made the possibility of utilizing mobile apps as a platform to provide HIV prevention information for Black women a feasible option. For a Black woman living in Georgia, navigating the health system can be challenging, especially when trying to access sexual and reproductive health services. Half of Georgia's 159 counties have no OB-GYN and the state ranks 48th in the nation in healthcare coverage for women. Atlanta's Center for Black Women's Wellness (CBWW) has been working to address these disparities and most recently began the research process to create a mobile health app, *In The Know*.

Purpose: The purpose of this special studies project is to develop a content guide targeted at Black women at CBWW with the appropriate sexual and reproductive health information and resources. The content created for the guide will be incorporated into the app currently being created by developers and researchers at Georgia Tech, Emory University, and Morehouse School of Medicine. It will provide a usable, comprehensive, medically accurate, and culturally appropriate health tool for CBWW.

Methods: The health content for the app was developed with input from CBWW clients and staff through 23 in-depth interviews. Thematic analysis was conducted using MAXQDA software. Findings were translated into two user personas and a content guide to support app development. The content guide was created with reference to a variety of reliable medical and public health resources.

Results: The three themes that were identified as priority topics to be included for the content of the app were sexual and reproductive health, mental health, and preventive health. Subthemes included sexually transmitted infections, pregnancy and birth, pregnancy prevention, anxiety, depression, substance use. Data analysis identified the need for women to: be able to distinguish different kinds of STIs and related treatment, misinformation around management of sexual health, and get referrals to trusted providers; be familiar with a range of delivery options; and have access to mental health resources, particularly in the context of the COVID-19 pandemic. Two user stories were created to visualize the health concerns and wants of the target users of the app. A content guide was created to cover the themes identified during data analysis for integration into the app.

Conclusion: Further efforts should be made to expand on the curriculum after completion and usability testing of the first prototype of the app to ensure the needs of the Black women who will be using the app are met. This should be accomplished through continued collaboration with researchers, CBWW staff and clients, and developers.

Cover Page

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A Special Studies Project

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Chapter 1: Introduction & Background

Black women in the United States disproportionately experience adverse sexual and reproductive health outcomes when compared to other groups, specifically their white counterparts. Black women face higher rates of sexually transmitted infections, HIV infections, infant and maternal mortality, unintended pregnancies, and pregnancy-related complication (CDC, 2017b, 2019a, 2019c, 2020; Muessig, Pike, LeGrand, & Hightow-Weidman, 2013). Social determinants of health include poverty, lack of access to quality and affordable care, inadequate housing, limited HIV prevention education, power dynamics in coupled relationships limiting women's ability to negotiate STI and HIV protection with regular male partners, while alcohol and drug use contribute to these higher rates (Hendrick & Canfield, 2017; Prather et al., 2006).

There are Black women that live in communities where they are at an increased risk of acquiring HIV based on the concentration of people living with HIV in their geographical area. Coupled with that, Black women have an increased chance of having contact with people who have multiple partners. These are both crucial factors to consider when public health professionals are developing interventions to address HIV and STI prevention interventions for Black women living in high-risk areas in the southern United States (Adimora, Schoenbach, & Floris-Moore, 2009; James & Harville, 2018).

There have been several evidence-based, face-to-face interventions to address HIV transmission and behavior change that have proven to be effective in reducing the sexual and reproductive health disparities that Black women face (CDC, 2017a; Hendrick & Canfield, 2017). However, these interventions have faced barriers related to retention, cost-effectiveness, scalability, and sustainability (Blackstock, Patel, & Cunningham, 2015; Hendrick & Canfield, 2017). For

example, traditional interventions face limitations with regard to accessibility, costs, transportation and logistics, and time constraints (James & Harville, 2018). However, mHealth interventions can overcome some of these barriers and offer advantages over traditional intervention models because of technological advances that provide the opportunity for benefits including but not limited to improved patient and provider communication, patient access to providers and medical or health information, and remote monitoring (James & Harville, 2018). Increased access to mobile technology among low-income communities has made the possibility of utilizing mobile apps as a platform to provide HIV prevention information for Black women a feasible option (Muessig et al., 2013).

Georgia has an estimated population of 10, 617,423 with 32.6% of the population being African American. In 2019, The United States Census Bureau estimated that Atlanta, Georgia, has a population of 506,000. African Americans make up 51.8% of the population. While there are world-class health facilities in Atlanta, there are still significant racial disparities that persist and result in a range of adverse health outcomes especially for the African American community. For a Black woman living in Georgia, navigating the health system can be challenging, especially when trying to access sexual and reproductive health services and information. Half of Georgia's 159 counties have no OB-GYN's and the state ranks 48th in the nation in healthcare coverage for women (Gurley, 2018; Thomas & Gusman, 2018) .

While this primarily affects Black women living in rural Georgia, there are still African American women living in the metro Atlanta community who need affordable and quality sexual and reproductive health services and resources. There are organizations in the city striving to ensure that Black women living in Atlanta have access to the sexual and reproductive care they need. One of those organizations is The Center for Black Women's Wellness (CBWW). The

center has been operating for more than 30 years with a mission to ensure that Black women and their families have access to the care they need.

CBWW primarily serves Black women in the Atlanta community through their three signature programs: The Wellness Program, Atlanta Healthy Start Initiative, and Women's Economic Self-Sufficiency Program (WESSP) (CBWW, 2018). The Wellness Program strives to broaden awareness of the various health issues affecting Black women, encourage personal behavior change to prevent disease, and provide preventive care and early screening and treatment of conditions before health problems arise. The Atlanta Healthy Start Initiative is a federally funded maternal and infant health initiative designed to improve maternal and infant health outcomes in communities with high infant mortality rates. The WESSP program is a microenterprise development initiative that strives to increase women's opportunity to become self-employed by starting and operating a micro business.

Finally, in pursuit of finding more ways to reach the women participating in the Atlanta Healthy Start Initiative, *In The Know*, a mobile health application is currently being developed by a team of public health practitioners and medical professionals from Emory University and Morehouse School of Medicine along with mobile app developers at Georgia Tech. The original concept for the app was created by Spelman and Morehouse students and was later adopted by Dr. Rasheeta Chandler to integrate into the CBWW Atlanta Healthy Start Initiative. Currently the app is in the development and design process, to be launched through the CBWW's Atlanta Healthy Start Initiative by the summer of 2021.

Problem Statement:

Dr. Rasheeta Chandler, a nurse practitioner, and professor of nursing, who has worked as a health provider with both The Wellness Clinic and Atlanta Healthy Start Initiative at CBWW for the past several years, saw the need to expand CBWW's reach to Black women living in Atlanta. CBWW has faced many challenges but has struggled primarily with funding. Therefore, Dr. Chandler and other staff members brainstormed ideas about producing more cost-effective strategies to reach their target population.

Additionally, Dr. Chandler conducted a study to understand cisgender Black women's preferences for functionality, format, and design of a mobile sexual and reproductive health (SRH) app and to examine their willingness to use an app for accessing information about SRH This study served as a foundation for the development of the *In The Know* mobile app that will provide comprehensive SRH information and linkages to care and resources for African American women living in Atlanta. The research team needed to better understand what the needs of the target users for the app were in order to identify what content would be best to integrate into the mobile app.

Purpose Statement/Objectives:

This project aims to identify the desired SRH topic areas and develop a content guide with the appropriate health content for *In The Know*. Content created for the mobile application is based on the analysis of in-depth interviews with CBWW patients and staff about the sexual and reproductive health needs. In order for the launch of the *In The Know* mobile app to be successful and effective, it will require careful design and development of the content. This special studies project aims to develop and design the content guide that will be integrated onto the digital platform. The objectives for generating the content guide are as follows:

1. Identify major sexual and reproductive health topic areas from patient and staff participant interviews
2. Create 2 User Personas: a semi-fictional representation of your ideal user based on market research and real data about CBWW's existing patients.
3. Develop content that aligns with the information needs identified in the study participant in-depth interviews

Significance Statement:

It is the role and mission of public health practitioners to reduce disparities in health and fill existing gaps for populations through innovative public health interventions. Leveraging technology has the potential to reduce sexual and reproductive health disparities among African American women living in Atlanta and across Georgia. This project aims to assist CBWW in expanding the organization's reach by contributing to the content development for the mobile app.

Definition of Terms and Abbreviations

Black/ African American – women who racially identify as Black or are descendants of a specific African ethnic group.

CBWW- Center for Black Women's Wellness

mHealth: mobile health technology

SRH- Sexual and Reproductive Health

Women of Reproductive Age- women aged 15-49 (USAID, 2012)

Chapter 2: Review of Literature

In creating the digital content guide for the *In The Know* mobile application, I explored existing literature in the following areas: sexual and reproductive health disparities among African American women in the United States, US historical events and their implications on SRH outcomes for African American women, and the potential impact of mHealth interventions in addressing SRH disparities amongst African American women in the U.S.

SRH Disparities in the United States and Georgia

This special studies project seeks to address the challenges Black women face in the United States, specifically in Atlanta, Georgia, related to sexual and reproductive health. The United Nations Population Fund defines good sexual and reproductive health as a state of complete physical, mental, and social well-being in every matter related to the reproductive system (UNFPA, 2020; UNPF, 2008).This definition implies that women can have safe and satisfying sex lives and can decide when and how often they would like to have children. For a woman to manage her sexual and reproductive health, she must first have access to accurate information on protecting herself from sexually transmitted infections and have access to effective, safe, and affordable contraceptive methods. Additionally, when she decides, a woman must also have access to quality and safe services to have a healthy and safe pregnancy and delivery, and ultimately a healthy baby.

Unfortunately, good sexual and reproductive health has not been a reality for all women due to the disparities and barriers unique to specific populations and geographic regions. Current research and data show that this is true for African American women of reproductive age living in the United States. Black women living in the United States are disproportionately affected by negative sexual and reproductive health outcomes when compared to their white counterparts. In

the U.S., Black women face higher rates of HIV, sexually transmitted infections, unintended pregnancy, infant and maternal mortality, and other pregnancy-related complications (CDC, 2017a, 2017b, 2019a, 2019c, 2020).

Chlamydia, Gonorrhea, Syphilis, and HIV

In 2018, the rate of reported chlamydia cases among Black women of all age groups was five times the rate of white women (Centers for Disease Control and Prevention (CDC), 2018). Among Black women aged 15-19 years of age, the rate of reported chlamydia cases was four and a half times the rate of white women in the same age group, while the rate among Black women aged 20-24 was 3.7 times the rate of white women in the same age group (Centers for Disease Control and Prevention (CDC), 2018). Among women aged 15-24 years of age, rates were the highest among Blacks in all U.S. regions (Centers for Disease Control and Prevention (CDC), 2018).

The overall rate of reported gonorrhea cases among Blacks living in the United States was approximately 7.7 times of whites (Centers for Disease Control and Prevention (CDC), 2018). The disparity was similar for Black women specifically, with a reported rate 6.9 times the rate of white women (Centers for Disease Control and Prevention (CDC), 2018). In considering all race categories, the rates of reported gonorrhea cases were highest for Black women aged 15-19, 20–24, and 25–29 years in 2018 (Centers for Disease Control and Prevention (CDC), 2018). The rate of reported gonorrhea cases for Black women aged 15-19 was 8.8 times the rate of white women, and for Black women aged 20-24, it was 6.9 times the rate of white women (Centers for Disease Control and Prevention (CDC), 2018).

The overall rate of reported primary and secondary syphilis cases among Blacks was 4.7 times the rate among whites, and the disparity was similar for reported cases specific to Black women (Centers for Disease Control and Prevention (CDC), 2018). Additionally, in 2018 the rate of reported congenital syphilis cases for Black women had increased by 126.7%, where the rate of reported cases among Black women was 6.4 times the rate for white women (Centers for Disease Control and Prevention (CDC), 2018). Although the number of reported HIV cases among Black women has shown a decrease in recent years, they still face higher rates of HIV than any other group of women (CDC, 2019a, 2020).

Pregnancy & Contraceptives

The disparities among Black women as they relate to pregnancy-related outcomes, are profound. In 2008, the rate of unintended pregnancies (pregnancies that are unplanned or unwanted at the time of conception), among Black women was 69% compared to 40% among white women and unintended pregnancies were most common among women and girls who were poor and cohabiting (Finer & Zolna, 2016). However, the resulting births due to unintended pregnancies were highest among Black and Hispanic women (Finer & Zolna, 2016; Institute, 2019). Among women who were at risk of unintended pregnancy in the United States, 16% of Black women were not using any form of contraception compared with 9% of white women (Dehlendorf et al., 2014; Mosher & Jones, 2010)

Additionally, Black women were less likely to have accurate information and use hormonal and longer-acting contraceptive methods(Kim, Dagher, & Chen, 2016; Mosher & Jones, 2010). This is of considerable concern, because unintended pregnancies have been linked to adverse maternal and infant health outcomes, including maternal mortality, post-partum depression, stress,

premature birth, low birth weight, and infant mortality (CDC, 2019c; Gipson, Koenig, & Hindin, 2008).

Sexual and Reproductive Health Disparities in Georgia

In 2015, approximately 39,393 people in the United States were diagnosed with HIV, the virus that causes AIDS, and about 1 in 7 people with HIV in the United States did not know that they were infected (Centers for Disease Control and Prevention (CDC), 2015). In 2015, approximately 2,381 adults and adolescents were diagnosed with HIV in Georgia, and the state ranked 5th among all 50 states in the number of HIV diagnoses in 2015 (Centers for Disease Control and Prevention (CDC), 2015).

There are currently 1,422,199 young people ages 15-24 living in Georgia, which makes up about 14 % of the population (Bureau, 2014). Georgia ranks 6th among all 50 states in rates of chlamydia (570.8 per 100,000) and 7th in rates of gonorrhea (158.3 per 100,000 persons) (Centers for Disease Control and Prevention (CDC), 2015). Rates of both chlamydia and gonorrhea are highest among women aged 20-24, followed by women aged 15-19 (Centers for Disease Control and Prevention (CDC), 2015). It is important to note that the adverse health effects of untreated gonorrhea and chlamydia can result in pelvic inflammatory disease, infertility, ectopic pregnancies, and increased risk of contracting HIV (GDPH, 2015; Spencer, 2017)

Finally, in 2013 compared to the national average of 26.5 pregnancies per 1,000 young women aged 15-19, Georgia reported 30.5 pregnancies per 1000 in the same age group (National Vital Statistics Report, 2013). The state of Georgia had the 12th highest teen pregnancy rate in the United States in the same year (Center for Disease Control and Prevention (CDC), 2013).

Social Determinants and Historical Implications of Poor SRH Outcomes for Black Women

As defined by the Centers for Disease Control and Prevention, social determinants of health are conditions in the places where people live, learn, work, and play, that affect a wide range of health outcomes. These social determinants have significantly impacted Black women's health for hundreds of years in the United States. Current research suggests that the adverse SRH outcomes for Black women highlight the intersectionality between individual, environmental, and contextual factors that have direct and indirect implications such as poorer birthing experiences, higher rates of maternal mortality or postpartum depression, and higher rates of STD's and HIV (Davis & Tucker-Brown, 2013; Geter, Sutton, & Hubbard McCree, 2018; Hendrick & Canfield, 2017; Oser et al., 2017; Paradies et al., 2015; Rosenthal & Lobel, 2020; Voisin, Tan, & DiClemente, 2013)

Moreover, Black women have endured a long legacy of medical abuse an experimentation and low-quality health care, resulting in Black women having a complex relationship with the American health system. Social determinants, including poverty, unemployment, and housing segregation, are associated with the larger system of institutionalized racism (Prather et al., 2018). Researchers suggest that public health officials will be more successful in addressing Black women's needs by considering the contextual factors that impact their health. Exploring the implications of historical events across four key areas that play a role in SRH outcomes for Black women, including slavery, Black Codes/Jim Crow, Civil Rights, and post-civil rights, would also be beneficial in understanding the relationship and challenges that the community presently has with the American health system (Prather et al., 2018)

Furthermore, risk factors for Black women's SRH outcomes include the sexual exploitation of the Black female body, racialized and sexualized stereotypes of Black women, and mass incarceration of Black men, providing further evidence of how social determinants put Black women at greater risk of HIV and STD acquisition (Davis & Tucker-Brown, 2013). It is essential that public health practitioners understand Black women's lived experiences and develop and design the most effective interventions that provide services to a group that has long been marginalized.

Benefits of mHealth Interventions in SRH

To address the unique challenges that Black women face and recognize the distinct factors of Black women's lived experiences in relation to sexual and reproductive health outcomes, there is a need to design and develop tailored SRH interventions. Current public health research demonstrates that when SRH interventions are tailored and population-specific, they are highly effective at reducing health disparities and promoting behavior change (Billings et al., 2015; Cornelius et al., 2013; El-Bassel, Caldeira, Ruglass, & Gilbert, 2009; Hendrick & Canfield, 2017; Prather et al., 2006). In striving for the greatest effectiveness, SRH interventions for Black women should focus on knowledge and skill development while targeting their attitudes and perceptions about SRH (Jenner et al., 2016).

Advancements in technology have created new pathways for health promotion interventions in the field of public health to address the barriers facing ethnic minority groups including African American women. One of the approaches to interventions has been the use of mobile health technology, or mHealth. Current mHealth interventions have demonstrated great promise when targeting historically underserved populations using approaches including text messaging, phone counseling, internet, social media, and mobile app interventions (Anderson-Lewis, Darville,

Mercado, Howell, & Di Maggio, 2018). Mobile health interventions may be cost-effective alternatives because they often require less staff training and time to implement while also providing the opportunity for customizable features tailored to the target population (Klein & Card, 2011). Additionally, research demonstrates that Black women who may have lower income and education levels are frequent users of mobile phones and more likely to access health-related information using mobile technology ((PWC), 2019; Anderson, 2015; Anderson-Lewis et al., 2018).

While mHealth presents a promising opportunity to address SRH needs in public health, there are still very few mHealth interventions that have been developed specifically for Black women living in the United States. The few existing studies that targeted African American adolescent girls and women will be discussed in the following section of this literature review. In the majority of the existing studies, behavior change models such as Social Learning Theory (SLT) (Card et al., 2011; El-Bassel et al., 2009; Manlove et al., 2020) and Social Cognitive Theory (SCT) (Gonzalez Gladstein, 2018; Klein & Card, 2011; Klein, Lomonaco, Pavlescak, & Card, 2013) were utilized in combination with other theories, such as the Theory of Gender and Power, as frameworks in the intervention design. The following section of this chapter will outline previous interventions targeting Black women by intervention type including: Computer-Based Interventions, Text Messaging, Telephone Counseling, Video Soap Opera Series, and Mobile Phone Applications.

Computer-Based Interventions

There are three studies utilizing web-based multimedia that focused primarily on reducing the risk of STIs and HIV amongst Black women (Billings et al., 2015; Card et al., 2011; El-Bassel et al., 2014; Klein & Card, 2011). The first intervention was called *Safe Sistah*, developed by

(Billings et al., 2015) and targeted at preventing HIV with a primary focus on condom negotiation and teaching women how to refuse sex in a way that minimizes the potential for intimate partner violence. *Safe Sistah* included a personalized risk reduction plan and was tailored to culture and gender by using audio-narration conducted with the voice of a Black woman and photos of Black women. Finally, the intervention offered prevention skills to the participants that were focused on promoting positive attitudes around racial identity and women's empowerment. The second intervention, *SAHARA (SISTAS Accessing HIV/AIDS Resources At-a-click),* was also targeted at preventing HIV, and included four key parts: 1) video clips with group discussions and modeling of sexual and contraceptive related behaviors, and 2) interactive modules that facilitated cognitive rehearsal through games and quizzes and role-play simulations (Card et al., 2011).

The third intervention, *WORTH*, randomized participants into 1) Traditional *WORTH*, 2) Multimedia WORTH, or 3) The Wellness Promotion arm. Traditional *WORTH* consisted of four group sessions that were pyscho educational and skills building focused on risk reduction problem solving and negotiation skills, condom use intentions, outcome expectancies, partner abuse risk assessment, social support, identification of service needs and linkage to services, and risk reduction goal setting. Multimedia *WORTH*, covered the same core components that were translated into computer games, interactive visual tools that gave participants the chance to respond to video enactments, social support, and risk maps. Lastly, the Wellness Promotion arm was also delivered in group format that addressed healthy diet, promoting daily fitness routines, tobacco use risk, and learning stress reduction exercises such as guided meditation and setting personal health goals.

Across all the studies, participants in the computer-based intervention group showed a decrease in having unprotected sex and an increase in condom use (Billings et al., 2015; Blackstock et al., 2015; Card et al., 2011; El-Bassel et al., 2014; Klein & Card, 2011; Klein et al., 2013). These studies were modifications of the original face-to-face interventions used to guide the development of web-based multimedia interventions. Compared to the face-to-face interventions, these computer-based models took participants significantly less time to complete (Blackstock et al., 2015), highlighting the potential of time and cost effectiveness of computer-based interventions. The content was tailored to be culturally and gender-specific in all of the interventions.

Furthermore, the core elements of the interventions employed an afro-centric focus to improve effectiveness and engage the target audience. Strengths of these interventions included engaging participants in dialogues about the positives and challenges of being Black women, unique risk factors for Black women's health, and increasing gender and ethnic pride (Billings et al., 2015; Card et al., 2011; El-Bassel et al., 2014; Klein & Card, 2011; Klein et al., 2013). In conclusion, all interventions used interactive features, including videos, quizzes, games, interactive exercises and modules, audio presentations, social support, and group discussions.

Text Messaging

A text messaging mHealth intervention was implemented at a Planned Parenthood family planning center that included women under the age of 25 in Brooklyn, New York, to see the impact of daily text messages on continued use of oral contraceptives (OCP) after six months. African American young women made up 39% of those who participated in the intervention. The participants in this study received a combination of contraceptive counseling and informational

handouts supplemented by text messages about contraceptive information for six months total, while the control group only received the latter. This study intervention demonstrated that 64% of participants had continued the use of oral contraceptives compared to the control group (Castaño, Bynum, Andrés, Lara, & Westhoff, 2012). While this study concluded that daily texts improved OCP's continuation, it did not utilize content tailored towards culture or gender.

Telephone Counseling

DiClemente et al (2014) aimed to evaluate the efficacy of a telephone-delivered counseling intervention. This was a hybrid intervention that included the *HORIZONS* face-to-face program (DiClemente et al., 2009) and ten-minute telephone counseling sessions from a health educator, which was then compared to the face-to-face intervention over eight weeks. The intervention included cultural and gender-specific content tailored to the target population and highlighted the unique risk factors contributing to Black women's risk of acquiring HIV and STIs. Additionally, patient risk factors drawn from a baseline risk assessment guided the development of content utilized during telephone counseling sessions. The intervention participants demonstrated higher condom use rates during sexual intercourse, fewer vaginal sex partners and STI diagnoses, and less alcohol and drug use than the control group.

Video Series

A 12-week, soap opera video series, *Love, Sex, and Choices* contained culturally appropriate and tailored HIV prevention messages on smartphones, compared to a text message control group that received HIV prevention messages weekly based on the recommendations provided by the Centers for Disease Control and Prevention (Jones, Hoover, & Lacroix, 2013). Episodes and characters were carefully designed to ensure that the program reflected the lived experiences of the target population. There was no statistically significant difference in decreased sexual risk

behavior between the control and intervention groups; however, participants in the video-series group showed a significant decrease in risky sexual behaviors from pre to post-intervention (Jones et al., 2013). Secondary data analysis of the Love, Sex, and Choices data showed that participants in the video arm displayed a decrease in high-risk sex scripts than the control group (Jones & Hoover, 2018).

Mobile Phone Applications.

A mobile phone application, Pulse, utilized tailored content focusing on reproductive health care services, effective birth control, and preventing unplanned pregnancies for Black and Latina women (Manlove et al., 2020). Activities, linkages to health services, and videos were incorporated throughout the application as the interactive content. A comparison was made with a health promotion app that focused on general health topics. Study findings highlighted that participants in the intervention group had higher rates of contraceptive knowledge than the control group and were more likely to have used some form of hormonal or long-term contraceptive.

GURHL Code was another mobile phone application whose primary aim was to improve sexual health knowledge by developing culturally specific SRH content and linkage to clinical services for Black and Latina women (Gonzalez Gladstein, 2018). In this study, the control group only received a one-pager containing a list of SRH services available online. However, similarly to *Pulse*, the application contained several interactive components, including videos, audio stories, quizzes, and linkage to care services (Gonzalez Gladstein, 2018; Manlove et al., 2020). When participants in the intervention were compared to the control group, the results showed a slight increase in condom knowledge, HIV, and STIs.

In conclusion, while some researchers suggest that Black women may be less likely to own a computer or laptop, Black women were more likely to own mobile phones compared to white women (Perrin Andrew, 2019). Mobile phones were the most commonly used platform in the mHealth interventions discussed in this literature review. This further supports the presumption that women's mobile phone access has the potential to improve sexual and reproductive health outcomes (LeFevre, Shah, Bashingwa, George, & Mohan, 2020). Therefore, the use of mobile phones in SRH mHealth interventions shows potential for improving Black women's access to accurate and culturally specific sexual and reproductive health information and linkages to SRH services and resources.

Additionally, when content is tailored to and reflects Black women's experiences, interventions have increased effectiveness in improving condom use, reducing risky behaviors, and ultimately reducing their risk of acquiring STIs and HIV (Gilbert & Goddard, 2007). The literature demonstrates increased effectiveness when contextual and cultural factors guide the development of mHealth interventions addressing SRH issues specific to Black women.

Chapter 3 Methods

Staff members identified the need to develop a mobile application specifically targeted to African American women at CBWW in Atlanta. The need for a women's SRH mobile application was recognized by key community members, stakeholders, and CBWW staff. At the beginning of 2020, the COVID-19 pandemic caused a shift in how CBWW as an organization delivered the resources and services needed by their key stakeholders. To adapt to the changing environment and maintain relationships with the community, CBWW staff member Dr. Rasheeta Chandler conducted a series of in-depth interviews to examine and identify what the CBWW community felt they needed and how a mobile application would serve them best.

Population & Ethical Considerations:

The Emory University Institutional Review Board, approved the study. This qualitative study was implemented from March to May 2020 with Black women aged 18 and older residing in metro Atlanta, participating in the Atlanta Healthy Start Initiative at CBWW. Participants were recruited for in-depth interviews via flyer distribution, email, and staff-to-client word of mouth.

Procedures & Data Collection:

In total, Dr. Chandler had previously conducted interviews with 24 Black women who are clients or staff members at CBWW. The interviews examined how they obtained COVID-19 information and evaluated the various impacts it had on their ability to access sexual and reproductive health services and information. Each interview demonstrated Black women's general preferences for apps, sexual and reproductive health content that would be useful in an app, and preferred app features that would promote continued use of the app. Each interview covered the following main topics: (1) COVID19, and its impact, (2) features of a sexual and reproductive health app, and (3) sexual and reproductive health content and resources.

Data Analysis

All in-depth interview audio files were transcribed verbatim using a professional transcription service, Otter.ai. Thematic analysis, combining inductive and deductive approaches, was completed using MAXQDA software. A codebook was compiled in close coordination between principal investigator and research assistants (Dr. Rasheeta Chandler, Charity Shaw, Sabreen Mohammed) drawing on existing literature, the research objective, aims, and themes that emerged during the in-depth interviews. The researchers then evaluated the in-depth interview transcripts to ensure congruency with the extracted themes using MAXQDA software. Following this process, the researchers discussed and compared their findings. Researchers then reviewed the transcribed text for overall impressions. Lastly, a line-by-line review for extraction of significant statements to be utilized in developing the codebook occurred.

A thematic analysis of the data was conducted using MaxQDA (Verbi Software), focusing on Black women's information needs relative to sexual and reproductive health by labeling data with reference to a codebook (Table x) that drew on inductive and deductive themes. After developing the codebook and analyzing the key thematic areas for information needs, two user personas were created using Sketch to extract specific statements about app content and app features. User personas outlined users' marital status, age, insurance status, education level, occupation, and location. Additionally, personas included a brief bio, goals of each user, quotes extracted from the interview data, and the user's frustrations.

Finally, the content guide was designed utilizing the themes that emerged from the thematic analysis. To develop the content guide began information was gathered from reliable public health and medically accurate resources. The content generated was then integrated into the functional app.

Content Guide Development

The content guide included information on sexually transmitted infections, pregnancy prevention and planning, pregnancy and birth, depression, anxiety, and general preventive health information. The SRH, mental health, and general preventative health information were pulled from the CDC website online. The content guide includes a directory of both accessible and affordable STD and HIV testing locations in the metro Atlanta area. Along with the STD and HIV testing locations, there is also a directory of PrEP providers included. All sites, hours, and phone numbers were extracted from the National Prevention Information Network through the CDC. The app's prototype consists of an interactive map that app users will be able to plug in their zip code and find the testing locations closest to them to call regarding appointments.

Although Dr. Chandler and I wanted to make this information available to the women who use the app, we also wanted to include links to videos on the web that cover the same information on SRH, mental health, and preventive health. When presented with readable information, patients may become less interested in learning about the topics, whereas videos do not require patients to read but rather listen and watch.

The mental health information included in the content guide primarily addresses depression, anxiety, and domestic violence. While domestic violence was not a prominent theme in the study, some women participants, both staff and patients, voiced concerns about women experiencing domestic abuse. While the app does not intend to address domestic violence as the primary issue, Dr. Chandler and I felt it would be helpful to include information about the cycle of abuse, the power and control wheel, and warning signs of domestic abuse.

Additionally, the content guide includes links to mental health podcasts that focus on the experiences of Black women. The app users can navigate to a *My Resources* tab and click on the links to access the podcasts and listen to them from their mobile device. The mental health section of the content guide includes a list of affirmations that will be integrated as push notifications that will pop up anytime a user opens the app on their phone. Dr. Chandler and I decided to include the affirmations to promote positivity regarding health and wellness. Due to time constraints, the prototype app will not include all of the information. However, the app will likely include the remaining content once the app is tested and the following stages of development begin.

Limitations & Delimitations

A delimitation of the study was that in-depth interviews were only conducted with Black women aged 18 and older living in Metro Atlanta who are clients and staff members at a community-based organization, CBWW. The decision was made by Dr. Chandler to only focus on this population because the CBWW community members would be the primary users of the application.

Chapter 4 Results

A total of 23 Black women participated in the in-depth interviews: they ranged in age from 18-30 years old. Demographic content was recorded for 15 of the 23 participants (65%), as 8 had opted out of completing the demographic form (See Table 1).

Majority of the participants in the study had never married (14/15, 93.3%), did complete high school (12/15, 80%), and had health insurance (12/15, 80%). Slightly less than half of the participants had a regular health care provider (7/15, 46%).

Table 1 Participant Demographics*

Category	Value, n (%)
Race (n=17)	
▫ **African American/Black**	**15 (100%)**
Age	
▫ **18 - 24**	**8 (53%)**
▫ **25 - 30**	**7 (46%)**
Marital Status	
▫ **Never Married/ Single**	**9 (60%)**
▫ **Not Married but living with a partner**	**4 (26.67%)**
▫ **Divorced Living with partner**	**1(6.6%)**
▫ **Not married in a relationship**	**1 (6.6%)**
Employment	
▫ **No, Unemployed**	**9 (60%)**
▫ **Yes, Full Time**	**5 (33.3%)**
▫ **Yes, Part Time**	**1(6.6%)**

Currently in School ▫ **Yes, Full Time** ▫ **No**	 **2 (13.3%)** **13 (86.67%)**
Highest Grade Level of Completion ▫ **Middle School (Grades 6-8)** ▫ **Some HS (Grades 9-12)** ▫ **High School Diploma** ▫ **Trade School** ▫ **Some College** ▫ **Undergraduate** ▫ **Graduate**	 **1 (6.6%)** **2 (13.3%)** **4 (26.67%)** **2 (13.3%)** **2 (13.3%)** **3 (20%)** **1 (6.6%)**
Insured ▫ **Yes** ▫ **No** ▫ **Unsure**	 **12 (80%)** **2 (13.3%)** **1 (6.6%)**
Regular HCP ▫ **Yes** ▫ **No (Urgent Care/ Emergency Room Services as needed)**	 **7 (46%)** **8 (53%)**
Yearly Household Income ▫ **$0- $10,000** ▫ **$10,000 - $20,000** ▫ **$20,000- $30,000** ▫ **$30,000 - $40,000** ▫ **$40,000- $50,000** ▫ **Over $50,000** ▫ **Unsure**	 **5 (33.3%)** **2 (13.3%)** **4 (26.67%)** **0** **3 (20%)** **0** **1 (6.6%)**
Where they Typically Receive Health Information? ▫ **Health Apps** ▫ **Google/Internet** ▫ **Social Media** ▫ **Doctor Office/Health Care Provider** ▫ **Family/Friends**	 **4 (26.67%)** **9 (60%)** **7 (46%)** **5 (33.3 %)** **6 (40%)**

Participants reported a variety of health topics that they would like to see represented in the content for *In the Know* mobile app, including: chronic diseases such as diabetes, heart disease, and high blood pressure; birth control and contraception; sexually transmitted infections; mental health; cancer; pregnancy and birthing; domestic violence; and substance use. Results were categorized into three major themes: Sexual and Reproductive Health, Mental Health, and Preventive Health.

The first overarching theme, *Sexual Health and Reproductive Health* included 3 subthemes, *sexually transmitted infections, pregnancy prevention and planning*, and *pregnancy and birth.* The second theme, *Mental Health,* included three sub themes, *anxiety, depression,* and *substance use and prevention.* The final theme was *Preventive Health.*

Sexual and Reproductive Health

Sexually Transmitted Infections

Participants in the study expressed the need to have comprehensive sexual and reproductive health topics that are relevant to a woman's overall health, included in the mobile app. Of the topics specifically related to sexual and reproductive health, some participants desired to have more information regarding sexual health, with a specific focus on sexually transmitted infections (STIs). While a portion of the participants who were clients at CBWW wanted more information on STIs, staff members at CBWW recognized that some clients were sometimes not able to make clear distinctions between the different types of STIs. One staff member stated:

> *I think women who come here often mistake ……something like bacterial vaginosis for something like chlamydia or HIV, that happens quite a bit, that they come into the clinic*

with fear that they might have HIV or syphilis. Because they're having a little bit of yeast or some type of irritation.

[Participant 7, CBWW staff, 28 years]

This observation from the staff member highlights the need to make clear distinctions about the different types of STIs that exist, how they are transmitted, how they are treated, and how each one differs from other STIs. This observation also will be helpful in how the content on STIs for the app needs to be framed to ensure that users are able to gain insightful information to help them in making healthy sexual behavior choices in the future to prevent STIs.

Although it was not a consistent theme throughout the data, one staff member mentioned that some clients at CBWW would also be using a vinegar and water home mixture as douches to get rid of bacteria in their vaginal area, which was cause for concern to her. While this was not a major theme in the data, it further highlights there may be some misinformation among clients about what health behaviors are least healthy when it comes to managing their sexual health.

Additionally, almost all participants expressed the need to have information about linkage to health providers that offered free and confidential STI testing and treatment in their communities. Staff members expressed that not only did women at CBWW need information about general health providers but that they could also use reviews about those providers from previous patients for reassurance that it was a highly rated provider.

Birth Control

In relation to SRH, another subtheme that was observed was pregnancy prevention and family planning. Many participants in the study discussed whether they had used any form of contraception which included but was not limited to condom use, birth control pills, the birth

control patch, Depo-Provera shot, Intrauterine Devices, tubal ligation, and exclusive breastfeeding.

While participants seemed to have used a variety of methods to prevent pregnancy, a substantial number of the women expressed concern about the side effects of methods like the IUD, birth control pills, the patch and the shot. Some of the side effects that participants experienced included significant weight gain, mood swings, and continuous or heavy bleeding which resulted in many of the women expressing that they had stopped using their chosen method completely because they did not feel like they were themselves.

One staff member expressed that some clients did not seem to understand after having a baby they needed to use some form of contraception to prevent pregnancy rather than just relying fully on exclusively breastfeeding. She stated that "*they don't really know the definition of exclusively breastfeeding and they end up pregnant again".*

Other staff members expressed that generally, some clients don't like the thought of having to plan for a baby or fully understand what the process of family planning and highlighted the need to include information in the app about family planning specifically. Family planning was often used as an umbrella term by participants in the study, where they seemed to also group birth control, pregnancy testing, and even STI and HIV prevention. It is important to note that there was no dividing line in some cases between the different topic areas because participants would often address two topics together as one.

Pregnancy, Birth and Delivery

Finally, the subtheme of pregnancy and birthing was common across all participants in the study. Some of the participants expressed the desire to know more general information about how the

reproductive system works, stating that it was a first important step to becoming a mother. While some participants had experienced vaginal births, others had experienced cesarean sections (C-sections). Staff members working with clients at CBWW expressed that there was a need for the women to have information about C-sections and birthing plans. One staff participant explicitly described the need for women to know about the different care providers that a woman can have on her birthing team, and that the only place for a woman to give birth is not in the traditional hospital setting. She stated:

> *I think a lot of times when we talk about like reproductive health, a lot of people don't have like information enough about C-sections. I feel like birthing is something that is important. I guess birthing and different birthing plans and developing a birthing team...I guess knowing that you don't just have to go to the hospital...I've met doulas that are in the African American community…A lot of people feel like the only option is to go to the hospital and that's not true because there's birthing centers and I think it's really important especially for this type of app for ones that accept Medicaid.*
>
> [Participant 12, CBWW staff]

Mental Health

Mental Health was a frequent theme throughout the data, with participants mentioning that many of them lived with anxiety and depression. Not only had many of the women had previous experiences with depression and anxiety, they expressed that the COVID-19 pandemic had exacerbated some of the mental health challenges they were already facing. It is important to know that mental health in the Black community has long been a health issue that has been widely ignored and not taken as seriously as other health challenges. Many participants expressed loss of employment and lack of financial security, and inability to meet the basic needs

of themselves and their families. Some staff participants said that some clients had even been evicted from their homes and when they tried to redirect them to housing resources, many shelters had reached capacity due to limited space.

Several of the women who participated in the study shared that they also had experienced post-partum depression, expressing that they would like more information on how to cope with postpartum depression. In addition to challenges that some of the women faced with postpartum depression another challenge was domestic violence.

Domestic violence was highlighted by both staff and clients from CBWW. Information about domestic violence and resources for survivors was proposed by participants as an important content area, with some highlighting that they knew of many other women in their communities experiencing similar challenges.

Unfortunately, some of the challenges related to loss of employment, lack of secure and safe housing, and mental health have also led some participants to resort to substance use. Some participants were staff members who also expressed that they have recognized many clients using recreational drugs, such as marijuana during pregnancy or during the post-partum period. One staff participant described additional content needs:

> *"Mental health, birth control following with the mental health and maybe addiction because I know they're not getting proper mental health, maintenance and everything. smoke a lot or pop pills. Just try to numb themselves."*
>
> [Participant 12, CBWW Staff]

General Preventive Health

Finally, participants were adamant about the app content including information about other aspects of health that are not specifically related to sexual and reproductive health. Some participants had expressed their firsthand experiences with diabetes being uncontrolled and contributing to their experiences with miscarriages and difficult pregnancies, or diabetes being a part of family medical history.

A noticeable commonality across the data was that a combination of diabetes, high blood pressure, and cholesterol seemed to be used interchangeably among participants as if they were to be treated as the same health issues. Similarly to some of the topics related to sexual and reproductive health, there was no dividing line between some of the general health issues that participants highlighted.

It was proposed by some participants that information about cancer, hypertension or high blood pressure, high cholesterol and heart disease would be important content to include in the app. To better illustrate the need for information on some of the aforementioned health topics one participant stated:

> *I think ...I'm diabetic so I always like more information about my like diabetes and how it affects everything. To go back like as far as reproductive health diabetes out of control really plays a major role on how your reproductive system works and it can affect it greatly. Like I've been around women that were not my age or older than me that but had miscarriage after miscarriage after miscarriage due to uncontrolled diabetes. So that's not something that's talked about. Um I think just health in general is always important to have open discussions about and information about because some people just don't know they don't know...*

[Participant 1, CBWW Client]

Finally, while more than half of the participants had mentioned diabetes, hypertension or high blood pressure, and cancer there were some additional topics that participants expressed interest about. Other health topics that participants expressed wanting information about included oral and skin health, and even self-help and feminine hygiene.

Psycho-Social Dimensions

The user stories highlight some psycho-social dimension including women's empowerment and lack of self- esteem. There were some participants who had expressed they needed more encouragement from women to build each other up and to also have more self-confidence.

"...I feel like as women we should stop downing each other. And you know, I'm saying like, what I'm trying to say like, Don't look at another woman as she can't do this because you got it or you know what i'm saying like we're all equal and we should all help each other." (Participant 14, age 29, CBWW staff)

User Stories

The results from the data collected also contributed to the development of the first iteration of user stories for the application before the first prototype. User stories are created to describe a likely user's background, answering the questions of who, what and why. Essentially, we want to understand the people who may be using this app, what they want to be able to learn or do in the app, and what their perceived benefits might be. This is an essential step to ensure that as researchers and developers we are designing a user-centered app. Based on the major themes in the data and reviewing what participants wanted to know, I was able to create two user stories based on compiling what the women discussed throughout the data. The user stories (Figure 2,

Figure 3) included their demographic information, frustrations, needs, goals, and direct quotations from in-depth interviews.

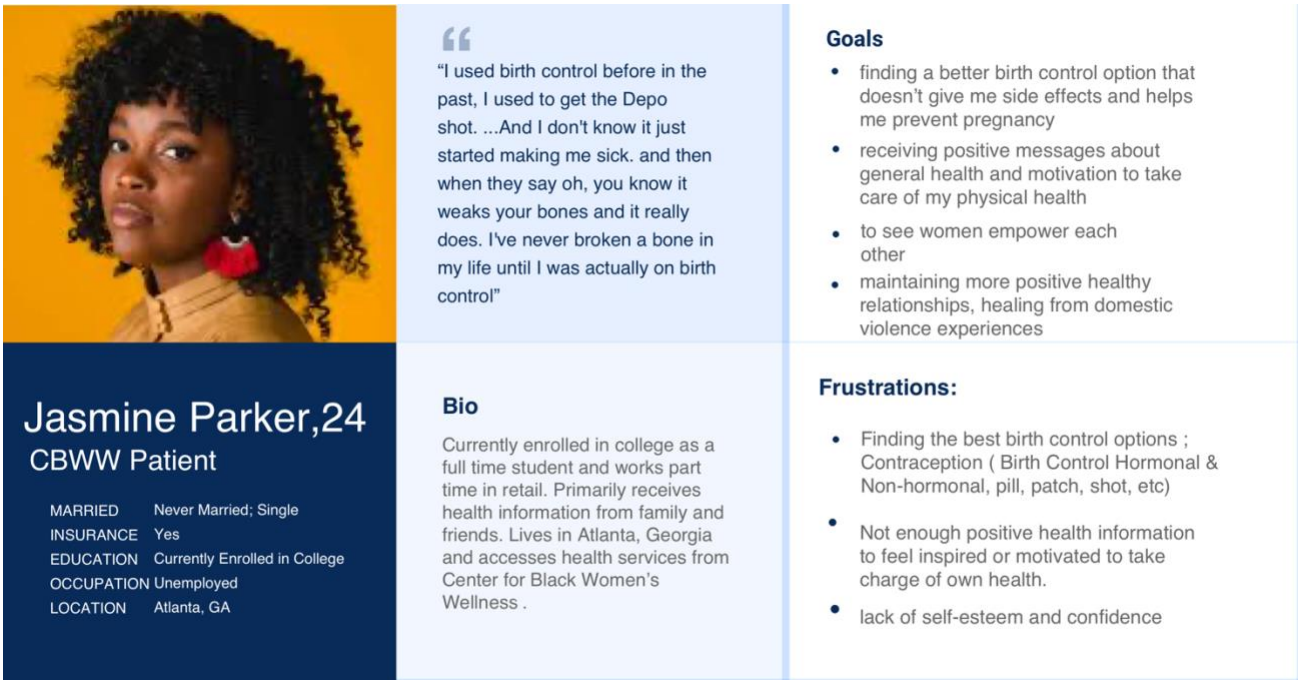

Figure 2. User Story 1

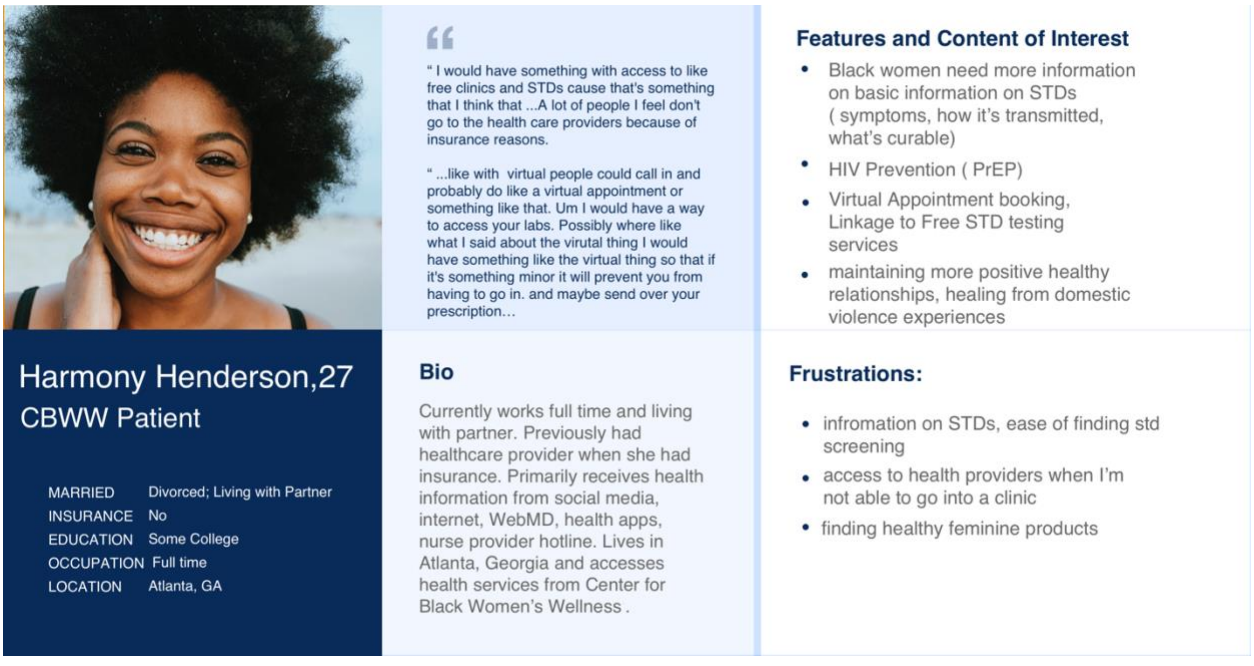

Figure 3. User Story

Chapter 5 Discussion

The formative research results indicate that the priority topics would be sexual and reproductive health, mental health, and preventive health. Having identified which topics were most important to the participants in the study, I sought to address them by creating a digital content guide, to assist in the development of the mobile app for CBWW. Participants who were clients wanted to have general information about STIs, while some staff members strongly believed that clients at CBWW needed to better distinguish different sexually transmitted infections that exist.

Some staff members highlighted health behaviors that some clients engaged in, related to their vaginal health that drew concern. Staff specifically pointed out the necessity for including general information regarding health behaviors such as vaginal douching, a method used to cleanse the vagina of menstrual blood or odors, and how it impacts vaginal health and can lead to vaginal infections. This further informs the need to include comprehensive information regarding STIs and engaging ways for the users of the app to actively learn about them. Although pregnancy prevention was primarily highlighted by women in the study who were clients at CBWW, staff members also discussed pregnancy prevention and planning as something that they saw as an information need for the women they served. Staff members want to encourage CBWW clients to explore family planning options and understand more about how to space out their babies.

Many of the women who participated had used some form of contraception at some point in their lifetime. However, they were concerned about the side effects of birth control, and the impact that it had on them physically, mentally, and psychologically. This finding is consistent with the

literature in regard to Black women being least likely to have accurate information about and use hormonal and longer acting contraceptive methods. Lack of use and accurate information about the distinct types of contraception that exist for a woman to use have been linked to adverse health outcomes including postpartum depression and stress (CDC, 2019c; Gipson et al., 2008). This further aligns with my findings in this study about the women's desire to have access to information and resources regarding mental health related issues including stress, postpartum depression, and anxiety. Participants, both staff and clients, highlighted the need for information regarding pregnancy prevention as a priority when creating content for the mobile app.

Participants across the study all stated that they wanted more information about pregnancy and birth. Majority of the women who participated in the study had at least one child. One particularly interesting topic that emerged from the findings was the mention of birthing plans by a staff member and the desire to share more information with women from CBWW regarding birthing options besides the conventional hospital birth. There was an expressed interest in assisting women with developing a birthing team that included doulas, and it was highlighted that this was recently becoming more prevalent among Black women giving birth. This highlights the Black women's' desire to have better birthing experiences. This could include women having a birthing team that includes doulas or midwives in addition to a physician. Women could also plan to deliver at a birthing center rather than a traditional hospital setting.

Many of the women who participated in the study also expressed that they had struggled with post-partum depression and anxiety, much of which was only exacerbated in 2020 due to the ongoing COVID-19 pandemic. Staff members who participated in the study expressed that they had recognized many of the clients engaging in the use of substances as a coping mechanism but expressed concern for how it could impact the health of the women and children.

While this intervention has not yet been implemented and evaluated, *In The Know* has the potential to stand out amongst previous interventions targeted at Black women because of the content and topical areas it will focus on. *Safe Sistah* a web-based intervention was focused on sexual communication and condom negotiation and included personalized risk reduction plans and content on gender empowerment and racial identity (Billings et al., 2015). The *SAHARA* intervention was a web-based intervention that focused on increasing the uptake of condom use through modules that included video clips, games, quizzes, and simulated role play (Card et al., 2011). The *SiHLE* intervention utilized similar features and focused on reducing HIV risk behaviors, but had an Afrocentric focus to promote ethnic and gender pride. The two mobile app interventions *GURHL* and *Pulse* were focused on general sexual and reproductive health topics including pregnancy, STIs, birth control, healthy relationships, and consent (Gonzalez Gladstein, 2018; Manlove et al., 2020).

The *In The Know* intervention unlike the interventions previously discussed, targets two other content areas that were not addressed including mental health and preventive health. In comparison to the web-based interventions, *In The Know*, being a mobile intervention has the potential to reach users where they are: on their smartphones. While my findings for this

study were about the sexual and reproductive health information that participants found most important, understanding more specifically what those topics were allowed me to develop a content guide that will be more culturally and contextually tailored. This is significant as the literature has demonstrated that SRH mHealth interventions have increased effectiveness in helping to reduce risky behaviors when the content is tailored and reflects the true-life circumstances of the users, which in this case are Black women (Gilbert & Goddard, 2007)

These results should be taken into account when considering what content is important to include in a mobile health app for this population. While the study targeted sexual and reproductive health topics, the findings showed that participants were interested in additional health topics. These topics included mental health and preventive health, specifically diabetes, cancer, hypertension, and cholesterol. These findings contribute a clearer understanding of what health challenges are impacting this population of women aside from sexual and reproductive health issues. Participants' desire to have a range of health topics included on the app builds on existing evidence that African –American women primarily access health information through the web or digital apps.

Strengths & Limitations

This project has been successful throughout the research and development phase due to the highly collaborative team of researchers, app developers, and tech personnel from Emory University, Georgia Technical Institute of Technology, and Morehouse School of Medicine. Data collection for this project was conducted solely with staff and clients from the Center for Black Women's Wellness (CBWW) given that CBWW clients are the intended user population. As all the participants in the study identified as African American, I was able to develop a more

culturally tailored and relevant content guide to be utilized in the development and design of the first app prototype.

The themes that emerged from this study and included in the content guide are informed directly by what the CBWW community of clients and staff identified as most important to them. The content guide being used by developers to inform the content and design of the app will allow returning and new clients to access information, resources, and linkage to care related to a range of sexual and reproductive health areas. While the app will not singlehandedly shift the level of SRH disparities impacting Black women living Atlanta, it is a novel way of ensuring that this population has access to culturally appropriate SRH information, and aims to help reduce risky health behaviors, encourage uptake of contraceptive use, STI and HIV testing and treatment, and improve general health and well-being.

Recommendations

Given that the content guide was developed early in the research process of the app being developed, further evaluation will be necessary to assess how effective the app will be for the users. Aside from the user experience and interaction design, the content for the app will need to be updated as more resources such as STI and HIV testing sites becoming available. Furthermore, to evaluate the usefulness of the topics included in the app, I recommend that app developers make it possible to capture in-app data on usage to gain new insights about how users are engaged in the use of the app, and to develop new strategies to reach more of the target users.

Additionally, I would recommend that the usability testing of the prototype of the app be conducted in-person if it is feasible. This will allow the organization and developers to understand how satisfied participants are with the product, identify changes required to improve user performance and satisfaction, and analyze the performance to see if it meets the usability objectives.

Conclusion

Black women remain a priority group when developing mHealth interventions related to sexual and reproductive health and addressing the disparities between Black women and other groups. Tailored mHealth interventions hold considerable potential for helping Black women overcome barriers to accessing accurate information and resources to manage their sexual and reproductive health. SRH interventions have increased effectiveness in helping to reduce risky behavior. The results of this study helped to identify the topics most important to the target population and those who serve them. The *In The Know* mobile app will be one of the first mHealth interventions specifically targeting Black women by providing more culturally tailored SRH content to women at CBWW.

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Appendix:

Codebook

Code/ Theme	Definitions
Sexual and Reproductive health	discussions about the app content that addresses sexuality and sexual relationships, as well as the possibility of having pleasurable and safe sexual experiences and having good sexual health; also addresses the reproductive processes, functions and system at all stages of life.
Sexually transmitted infections	discussion about app content related to infections passed from one person to another person through sexual contact.
Pregnancy Prevention and Planning	discussion about app content related to methods of contraception or birth control to prevent and/or plan pregnancies
Pregnancy and Birth	discussion about app content related to the pregnancy process from pre to postpartum, including birth and or types of birthing options.
Mental Health	discussion about app content related to emotional, psychological, and social well-being including mental illnesses such as anxiety and depression and their risk factors for substance use.
Anxiety	Discussion about experiences or feelings related to having anxiety disorders resulting in the inability to complete everyday task due to excessive worry or fear
Depression	Discussion about experiences or feelings related to having depression that affects how one may think, feel, and handle daily activities with persisting feelings of sadness, hopelessness, or loss of interest

Substance Use	Discussion about experiences related to one's use of substance including alcohol, tobacco, marijuana, or other drugs.
Preventive Health	discussion related to prevention of illnesses like diabetes or hypertension to decrease the burden of disease and associated risk factors

Table 1

Table 1 Participant Demographics*	
Category	**Value, n (%)**
Race (n=17) ▫ **African American/Black**	**15 (100%)**
Age ▫ **18 - 24** ▫ **25 - 30**	**8 (53%)** **7 (46%)**
Marital Status ▫ **Never Married/ Single** ▫ **Not Married but living with a partner** ▫ **Divorced Living with partner** ▫ **Not married in a relationship**	**9 (60%)** **4 (26.67%)** **1(6.6%)** **1 (6.6%)**
Employment ▫ **No, Unemployed** ▫ **Yes, Full Time** ▫ **Yes, Part Time**	**9 (60%)** **5 (33.3%)** **1(6.6%)**
Currently in School ▫ **Yes, Full Time** ▫ **No**	**2 (13.3%)** **13 (86.67%)**

Highest Grade Level of Completion ▫ **Middle School (Grades 6-8)** ▫ **Some HS (Grades 9-12)** ▫ **High School Diploma** ▫ **Trade School** ▫ **Some College** ▫ **Undergraduate** ▫ **Graduate**	**1 (6.6%)** **2 (13.3%)** **4 (26.67%)** **2 (13.3%)** **2 (13.3%)** **3 (20%)** **1 (6.6%)**
Insured ▫ **Yes** ▫ **No** ▫ **Unsure**	 **12 (80%)** **2 (13.3%)** **1 (6.6%)**
Regular HCP ▫ **Yes** ▫ **No (Urgent Care/ Emergency Room Services as needed)**	 **7 (46%)** **8 (53%)**
Yearly Household Income ▫ **$0- $10,000** ▫ **$10,000 - $20,000** ▫ **$20,000- $30,000** ▫ **$30,000 - $40,000** ▫ **$40,000- $50,000** ▫ **Over $50,000** ▫ **Unsure**	 **5 (33.3%)** **2 (13.3%)** **4 (26.67%)** **0** **3 (20%)** **0** **1 (6.6%)**
Where they Typically Receive Health Information? ▫ **Health Apps** ▫ **Google/Internet** ▫ **Social Media** ▫ **Doctor Office/Health Care Provider** ▫ **Family/Friends**	 **4 (26.67%)** **9 (60%)** **7 (46%)** **5 (33.3 %)** **6 (40%)**

Figure 1: User Story 1

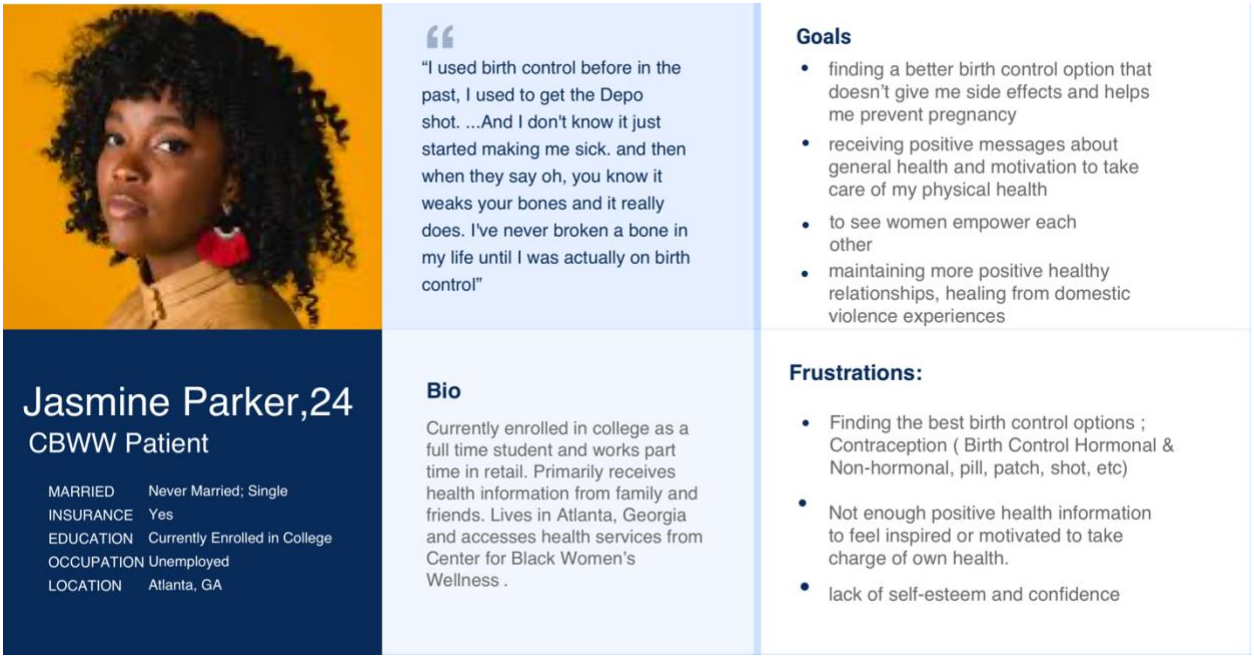
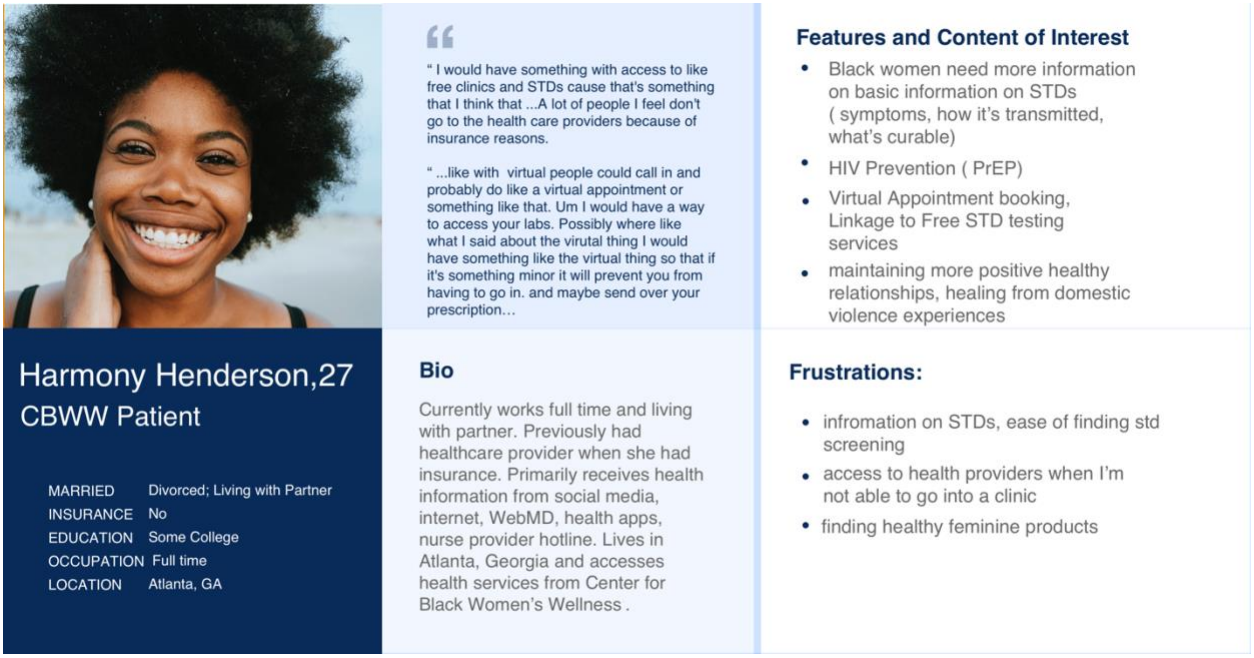


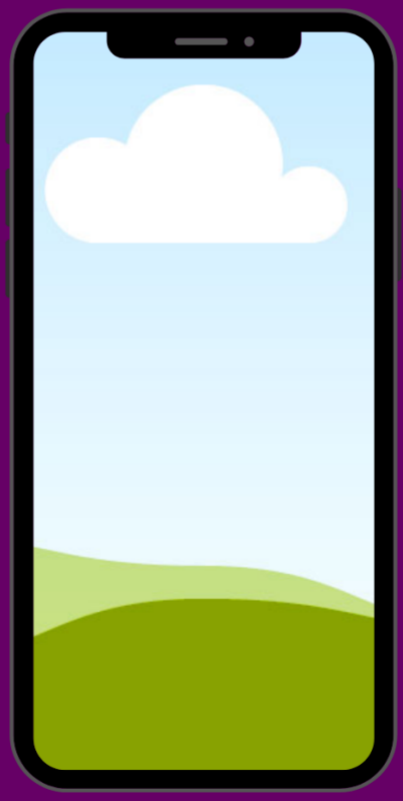
Figure 2: User Story 2



Center for Black Women's Wellness

APP CONTENT GUIDE

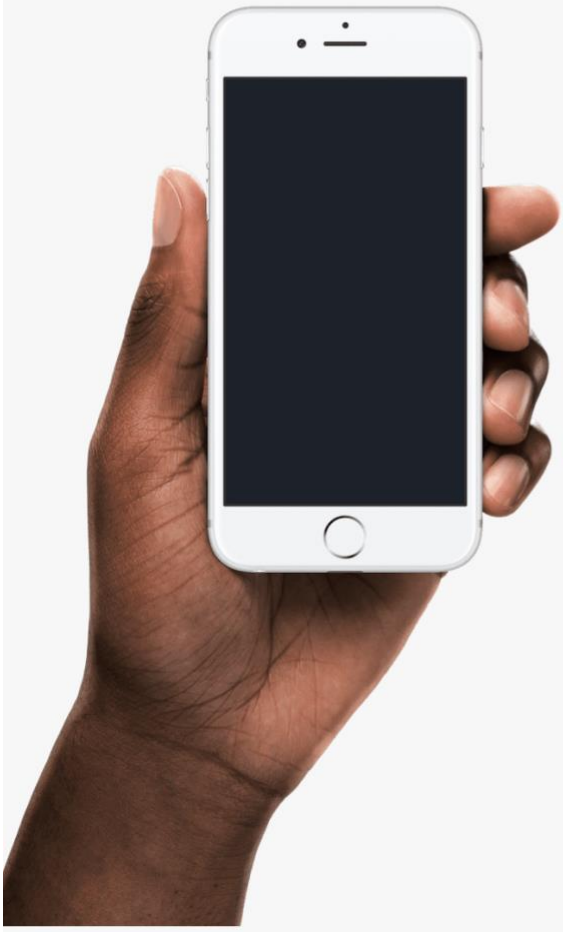
IN THE KNOW:
A COMPREHENSIVE SEXUAL AND REPRODUCTIVE HEALTH APP



CURATED BY CHARITY SHAW
EMORY GLOBAL GRADUATE STUDENT

ABOUT THE APP

in-the-KNOW is an HIV prevention and optimal sexual and reproductive health promotion mobile app created based on formative work with Black women to ultimately increase HIV and STI testing, promote PrEP uptake, and reduce HIV risk behavior.



IN THE KNOW GOALS

- increase uptake in HIV and STI testing
- Promote uptake of PrEP
- Provide comprehensive sexual and reproductive health information
- reduce HIV risk behavior
- Link patients to Free + Low Cost STI HIV Testing

PROJECT DEVELOPMENT

INTERVIEWS

A series of in-depth interviews were conducted by Dr. Rasheeta Chandler, with CBWW staff and clients. In depth interviews were transcribed using AI software, Otter.ai.

ANALYSIS

In-Depth interviews, were reviewed, coded, and analyzed by researchers using MAXQDA software, to identify major themes or topics that were most important to include for the app content.

CATEGORIZATION

Content was categorized into three major themes and 13 related sub-themes including: Sexual and Reproductive Health, Mental Health, and Preventive Health.

CONSOLIDATION

Content Guide was created to consolidate content for all codes and categories.

TARGET USER

African American women aged 18-30 living in Atlanta, GA

THE WHY

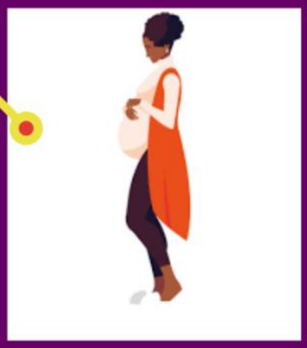
- Black women in the South are an HIV prevention priority.
- Female HIV acquisition is elevated in late pregnancy and postpartum.
- HIV risk for Black women in the South is heightened by inequitable access to health resources.
- Mobile technology-based HIV prevention interventions have shown promise with priority populations, such as MSM; however, no HIV prevention mobile apps have been developed with or for Black women
- There are limited culturally and contextually relevant HIV prevention interventions for Black women, and there are limitations to those that do exist.

Black women have the second-highest rate of all new HIV infections in the U.S. after men who have sex with men. Black women who reside in the U.S. South face a disproportionate burden of the disease, accounting for 69% of all HIV diagnoses among cisgender women—making this a high-priority geographic region for research to combat the HIV epidemic. Cities where HIV prevalence is high, have reported a rise in HIV diagnosis among cisgender Black women (hereafter Black women), underscoring, the urgent need for targeted, scalable, and accessible HIV prevention interventions for this group. Staff and researchers at CBWW have made it a priority to ensure that the black women they serve do not have to be a statistic. Through collaboration with researchers and app developers from Morehouse, Georgia Tech, and Emory, In The Know will be one of the first digital apps to provide culturally and contextually relevant sexual and reproductive health resources and information through a digital application.

WHAT WILL USERS HAVE ACCESS TO ?

Linkage to local STI and HIV testing centers and providers in the metro Atlanta area.

Access to comprehensive sexual and reproductive health information including, sexually transmitted infections, birth control, pregnancy and birthing information, etc.



General wellness and health information about preventable diseases including hypertension, diabetes, high cholesterol, and mental health illnesses including depression, anxiety, etc.

BIRTH CONTROL OPTIONS

IUD (Non-hormonal/Hormonal) A small t-shaped device that is placed inside of the uterus by a health care provider to prevent pregnancy 99% of the time. Less than 1 out of 100 women will get pregnant each year if they use an IUD. Available in non-hormonal (copper) and hormonal (plastic) options, the IUD is one of the most effective forms of birth control and can last anywhere between 3 to 10 years depending on which type you choose. Non-hormonal and hormonal IUDs work to prevent sperm from fertilizing an egg.

Implant (Hormonal) A small rod placed under the skin in the upper arm by a health care provider to prevent pregnancy 99% of the time. Less than 1 out of 100 women a year will become pregnant using the implant. The implant, which lasts for 3 years, releases the hormone progestin to stop the ovaries from releasing eggs, and it thickens cervical mucus, so it is difficult for sperm to enter the uterus.

The Shot (Hormonal) An injection given by a medical professional of the hormone progestin in the arm or hip that lasts three months and prevents pregnancy 99% of the time. Less than 1 out of 100 women will get pregnant each year if they always use the shot as directed. The shot, also known as Depo-Provera, stops the ovaries from releasing eggs and thickens the cervical mucus, so it is difficult for sperm to enter the uterus.

The Vaginal Ring (Hormonal) A flexible ring that is inserted into the vagina each month for three weeks at a time that prevents pregnancy 99% of the time. Less than 1 out of 100 women will get pregnant each year if they always use the ring as directed. The vaginal ring releases hormones that stop the ovaries from releasing eggs and thickens cervical mucus, so it is difficult for sperm to enter the uterus.

Patch (Hormonal) The patch is applied (like a sticker) weekly anywhere on the skin (except for the breasts) and prevents pregnancy 99% of the time. Less than 1 out of 100 women will get pregnant each year if they always use the patch as directed. The patch releases hormones that stop the ovaries from releasing eggs, and it thickens cervical mucus, so it is difficult for sperm to enter the uterus.

The Pill (Hormonal) A pill that should be taken at the same time every day for maximum effectiveness, which is often used to reduce cramping and bleeding during periods and that prevents pregnancy 99% of the time. Less than 1 out of 100 women will get pregnant each year if they take the pill each day as directed. The pill releases hormones (progestin-only or a combination of hormones) to stop the ovaries from releasing eggs and thickens cervical mucus, so it is difficult for sperm to enter the uterus.

Condoms (Non-hormonal) Available in latex or polyurethane, condoms, which prevent pregnancy 98% of the time, are placed over an erect penis to stop sperm from entering the vagina during ejaculation. 2 out of 100 women whose partners use condoms will get pregnant if they always use condoms correctly. Insertive/female condoms are inserted into the vagina and prevent pregnancy 95% of the time. This means that 5 out of 100 women will become pregnant if the insertive condom is always used correctly. Not only are condoms arguably one of the most affordable, accessible forms of birth control, they also protect against STDs.

SEXUALLY TRANSMITTED INFECTIONS

Sexually Transmitted Infections

Disease/ Type	How is transmitted ?	Symptoms
Genital Herpes (HSV)	Close skin contact with someone with the virus; from mother-to-baby.	• Tingling or itching of the skin around the genitals • One or a group of painful, watery blisters in or around the genitals, or wherever there is skin to skin contact (hips, nipples, anus) • These blisters break and form open sores that crust or scab lasting 7-21 days • Burning when you urinate (pee) • Flu-like symptoms (usually during the outbreak) • Tender, swollen glands in the groin
Hepatitis B	By having vaginal, anal or oral sex without a condom with someone who has the infection; form mother-to-baby. By sharing needles, syringes, toothbrushes, razors and unsterilized instruments that pierce the skin.	fever • nausea • weight loss/ loss of appetite • yellow tinge to skin or whites of the eyes • dark coloured urine, pale stool • skin rash • swollen, painful joints • fatigue • pain over liver (right side of abdomen under ribcage) • 50% show no signs of infection
Human Immunodeficiency Virus (HIV/AIDS)	HIV is transmitted through blood, semen and vaginal fluids, sharing needles and from mother-to-baby. Blood transfusion in countries that do not pre-test blood for transfusion.	HIV – infected people often have no symptoms and look and feel fine. Some people with HIV will have symptoms like fatigue; loss of appetite, night sweats etc. • AIDS – (occurs after the virus has damaged the immune system) People may have symptoms like extreme weight loss, unusual skin infections, pneumonias or cancers
Human Papillomavirus (HPV)	Through direct skin to skin contact or unprotected vaginal, oral or anal sex	• Warts may be round, flat or raised small cauliflower-like bumps that are flesh/grey coloured • Warts can be single or in clusters • Warts can be found in and around the genital area.
Chlamydia	By having vaginal or anal sex without a condom with someone who has the infection; from mother-to-baby (eye and chest infection)	Unusual discharge from the vagina • Bleeding/spotting between periods • Bleeding or pain during or after sex • Lower abdominal pain • Burning when urinating
Gonorrhea " The Clap"	By having vaginal, anal or oral sex without a condom with someone who has the infection; from mother-to-baby (eye infections).	• Thick yellowish vaginal discharge • Abnormal vaginal bleeding • Lower abdominal pain • Pain during intercourse

SEXUALLY TRANSMITTED INFECTIONS

Syphilis	By having vaginal, anal or oral sex without a condom with someone who has the infection; from mother-to-baby across placenta during pregnancy (congenital syphilis).	Painless sore(s) (chanchre) from pinpoint size to as large as a quarter • Flu-like symptoms, fever, fatigue, pai in the joints and muscles • Painless rash on hands, feet or whol body • Swollen lymph nodes • Hair loss • Untreated may result in headache, dizziness, changes in personality, dementia
Bacterial Vaginosis	It may be brought on by anything that changes the balance in the vagina, eg, new sexual partners, increased sexual activity.	Greyish white, smelly vaginal discharg
Pubic LIce (Crabs)	By close body contact, usually during sex with an infected person. Can be spread via infected bedding and clothing.	Intense itching in the pubic area, small nits (eggs) on pubic hair.
Scabies (Mites)	By close body contact, sometimes during sex. Can be spread by sharing clothes or bedding.	Itching, worse at night, and a rash on the body.
Trichomoniasis (Trich)	During sexual intercourse with an infected person.	Foamy yellow or green discharge, foul or musty smelling discharge and/or burning or itching around the vagina
Yeast Infection or (Candida)	most often caused by antibiotics, birth control pills, perfumed products, vaginal contraceptives,	Clumpy white discharge from the vagi and/or itching and redness around the vagina

STI & HIV TESTING CENTERS

AHF Wellness Center - AID Atlanta	1605 Peachtree Street NE Atlanta, GA 30309-2955 (404) 870-7700
Planned Parenthood Atlanta	440 Moreland Avenue SE Atlanta, GA 30316 404-688-9300
The Center at 246 Emory Sexual Health Center	246 Sycamore St Decatur, Georgia 30030 (404) 712-9001
Positive Impact Health Centers	523 Church St Decatur, Georgia 30030 (404) 589-9040
Sisterlove Inc.	1237 Ralph David Abernathy Blvd Atlanta, Georgia 30310 (404) 254-4734
NAESM INC.	2140 Martin Luther King Jr Dr SW Atlanta, Georgia 30310 (404) 691-8880

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PREP

What is PrEP?
PrEP (pre-exposure prophylaxis) is medicine people at risk for HIV take to prevent getting HIV from sex or injection drug use.

Types of PrEP
- Truvada®external icon
- uuDescovy®external icon
- is for people at risk through sex, except for people assigned female at birth who are at risk of getting HIV from vaginal sex.

Safety of PrEP
PrEP is safe but some people experience side effects like diarrhea, nausea, headache, fatigue, and stomach pain. These side effects usually go away over time.
Tell your health care provider about any side effects that are severe or do not go away.

How Effective is PrEP?
- PrEP is highly effective for preventing HIV.
- PrEP reduces the risk of getting HIV from sex by about 99% when taken as prescribed.
- Although there is less information about how effective PrEP is among people who inject drugs, we do know that PrEP reduces the risk of getting HIV by at least 74% when taken as prescribed.
- PrEP is much less effective when it is not taken as prescribed.

How long do I have to take PrEP before it is highly effective?
- PrEP reaches maximum protection from HIV for receptive anal sex (bottoming) at about 7 days of daily use.
- For receptive vaginal sex and injection drug use, PrEP reaches maximum protection at about 21 days of daily use.
- No data are available for insertive anal sex (topping) or insertive vaginal sex.

Is PrEP for me?
PrEP may be right for you if you test negative for HIV, and any of the following apply to you:

You have had anal or vaginal sex in the past 6 months and you
- have a sexual partner with HIV (especially if the partner has an unknown or detectable viral load),
- have not consistently used a condom, or
- have been diagnosed with an STD in the past 6 months.

You inject drugs and you
- have an injection partner with HIV, or
- share needles, syringes, or other equipment to inject drugs (for example, cookers).

You have been prescribed PEP (post-exposure prophylaxis) and you
- report continued risk behavior, or

How can I pay for PrEP?

Most insurance plans and state Medicaid programs cover PrEP. There are also other programs that provide PrEP for free or at a reduced cost:
Ready, Set, PrEPexternal icon
makes PrEP medication available at no cost to those who qualify.
Co-pay assistance programsexternal icon
help lower the costs of PrEP medications. Income is not a factor in eligibility.
Some states have PrEP assistance programsexternal icon
. Some cover medication, some cover clinical visits and lab costs, and some cover both.

How can I start PrEP?

Talk to your health care provider if you think PrEP may be right for you. PrEP can be prescribed only by a health care provider.

- Before beginning PrEP, you must take an HIV test to make sure you don't have HIV.
- While taking PrEP, you'll have to visit your health care provider every 3 months for
  - follow-up visits,
  - HIV tests, and
  - prescription refills.
- Ask your health care provider about self-testing and telehealth services for follow-up visits.

Can I start PrEP or continue taking PrEP without in-person visits to a provider?
Yes. With telemedicine (phone or video consultation with a health care provider) and mail-in self-testing, it is possible to order a specimen collection kit which contains the supplies to do all the testing required to start or continue taking PrEP, even if an in-person appointment is not possible. Contact your health care provider to see what options are available to you. You can also locate a PrEP provider online.
What if I need to stop taking PrEP?
There are several reasons why people stop taking PrEP:

- Your risk of getting HIV becomes low because of changes in your life.
- You don't want to take a pill as prescribed or often forget to take your pills.
- You have side effects from the medicine that are interfering with your life.
- Blood tests show that your body is reacting to PrEP in unsafe ways.

Talk to your health care provider about other HIV prevention methods that may work better for you.

If I stopped taking PrEP, how do I start taking it again?
Tell your health care provider that you would like to start taking PrEP again. You will need to take an HIV test before you start PrEP to make sure you don't have HIV.

Can I take PrEP just once, if I think I might have recently been exposed to HIV?

- PrEP is for people who are at ongoing risk for HIV.
- PrEP is not the right choice for people who may have been exposed to HIV in the last 72 hours.
- If you may have been exposed to HIV in the last 72 hours, talk to your health care provider, an emergency room doctor, or an urgent care provider about PEP (post-exposure prophylaxis).

Why do I need to take PrEP as prescribed?

You must take PrEP as prescribed for it to work.
If you do not take PrEP as prescribed, there may not be enough medicine in your bloodstream to block the virus.
The right amount of medicine in your bloodstream can stop HIV from taking hold and spreading in your body.
Will PrEP interfere with my hormone therapy?

There are no known drug conflicts between PrEP and hormone therapy, and there is no reason why the drugs cannot be taken at the same time.

Can I stop using condoms if I take PrEP?

- PrEP provides protection from HIV, but does not protect against other STDs.
- Condoms can help prevent other STDs that can be transmitted through genital fluids, such as gonorrhea and chlamydia.
- Condoms are less effective at preventing STDs that can be transmitted through sores or cuts on the skin, like human papillomavirus, genital herpes, and syphilis.

PREP PROVIDERS

AAbsoluteCARE Medical Center and Pharmacy	2140 Peachtree Rd Ste 232 Atlanta, GA 30309 404) 231-4431
NAESM Mens Health and Wellness Center	2140 Martin Luther King Jr Dr SW Bldg .A Ste 202 Atlanta, GA 30310 (404) 609-3197
Southside Medical Center	1100 Cleveland Ave SW East Point, GA 30344 (404) 688-1350
Southside Medical Center	2578 Gresham Rd SE Atlanta, GA 30316 (404) 688-1350
Southside Medical Center	1046 Ridge Ave SW Atlanta, GA 30315 (404) 564-6913
Southside Medical Center	540 Fayetteville Rd Atlanta, GA 30316 (404) 688-1350

PREP PROVIDERS

Empowerment Resource Center Incorporated	2230 Peachtree St NW Ste 1800 Atlanta, GA 30303 (404) 526-1145
Grady Health System	80 Jesse Hill Jr Dr SE Atlanta, GA 30303 (404) 616-7737
Mercy Care	424 Decatur St Atlanta, GA 30312 (678) 843-8600
Faebris Medical and Community Education	285 Blvd NE Ste 145 Atlanta, GA 30312 (404) 337-7486
The Center at 246 Emory Sexual Health Center	246 Sycamore St Ste 200 Decatur, GA 30030 (404) 712-9001
Positive Impact Health Centers	523 Church St Decatur, GA 30030 (404) 589-9040

DOMESTIC VIOLENCE

UNDERSTAND ABUSE Domestic violence (also referred to as intimate partner violence (IPV), dating abuse, or relationship abuse) is a pattern of behaviors used by one partner to maintain power and control over another partner in an intimate relationship.

Domestic violence doesn't discriminate. People of any race, age, gender, sexuality, religion, education level, or economic status can be a victim — or perpetrator — of domestic violence.

That includes behaviors that physically harm, intimidate, manipulate or control a partner, or otherwise force them to behave in ways they don't want to, including through physical violence, threats, emotional abuse, or financial control.

DOMESTIC VIOLENCE

Warning Signs of Abuse

- Telling you that you never do anything right.
- Showing extreme jealousy of your friends or time spent away from them.
- Preventing or discouraging you from spending time with friends, family members, or peers.
- Insulting, demeaning, or shaming you, especially in front of other people.
- Preventing you from making your own decisions, including about working or attending school.
- Controlling finances in the household without discussion, including taking your money or refusing to provide money for necessary expenses.
- Pressuring you to have sex or perform sexual acts you're not comfortable with.
- Pressuring you to use drugs or alcohol.
- Intimidating you through threatening looks or actions.
- Insulting your parenting or threatening to harm or take away your children or pets.
- Intimidating you with weapons like guns, knives, bats, or mace.
- Destroying your belongings or your home.

DOMESTIC VIOLENCE

Power and Control Wheel

Domestic violence is a pattern of behaviors used to gain or maintain power and control.

The wheel serves as a diagram of tactics that an abusive partner uses to keep their victims in a relationship. The inside of the wheel is made up of subtle, continual behaviors over time, while the outer ring represents physical and sexual violence. Abusive actions like those depicted in the outer ring often reinforce the regular use of other, more subtle methods found in the inner ring.

Caption

AFFIRMATIONS FOR PUSH NOTIFICATIONS

- I am healthy and full of energy
- Healthy, vibrant energy flows through my body naturally
- I easily attract good and positive energy to mind, body, and soul
- The Universe helps me achieve beautiful levels of health and wellness
- I enjoy existing in a natural state of wellbeing
- I welcome positive and healthy energy with open arms
- Every day is an opportunity to enjoy new levels of energy and well being
- I choose to let my natural, glorious, and healthy energy shine
- It comes naturally for me to feel good and healthy
- I am a magnet for healthy, uplifting, and empowering energy
- I am filled with calm energy knowing the Universe has my back
- I allow peaceful and healing white light to flow through my body now
- I foster calm energy in my mind, body, and spirit
- My body feels peaceful energy flowing in and around me regularly
- I choose calm energy now
- Tranquil and soothing energy flows easily to me
- I am able to shift to calm energy whenever I desire
- I let go of upsetting energy and embrace peaceful energy in its place
- I choose to have a peaceful day
- I allow tranquil and serene energy, thoughts, and things to flow easily to me
- In this moment, I am safe

MENTAL HEALTH PODCASTS

- **Therapy for Black Girls** with Dr. Joy Bradford based in Atlanta,GA
- **AFFIRM** The podcast for women of color who affirm their worth, value mental health, and seek wholeness. Hosted by former therapist & creator of Redefine Enough, Davia Roberts.
- **Between Sessions:** [dope therapists + dope conversations] from Melanin & Mental Health. Two brown chicks changing the face of therapy on both sides of the couch.
- **Celeste the Therapist:** The purpose of CelesteTheTherapist podcast is to help shift the way you think. Many times, we get stuck in a negative cycle and struggle with getting out. Celeste will interview guests from different backgrounds who empower people in different capacities.
- Fireflies Unite Podcast With Kea, a weekly podcast dedicated to bringing light into darkness (just like the fireflies) by sharing the stories of individuals thriving with mental illness within communities of color despite the disadvantages and racism that negatively impact their mental health. The mission of the podcast is to encourage people of color to seek treatment, end the stigma and raise awareness by sharing stories. We want to show that mental illness does not have "a look"; it also includes everyday high functioning people.
- **Talking off the couch:** Talking off the Couch is a podcast that focuses on mental health and mental wellness with in the community of color. Based in Dallas, Texas, Talking off the Couch was created by Tatiana Smith who is a Licensed Professional Counselor.
- **The Bodyful Black Girl: J**ennifer Sterling, Holistic Nutritionist and Creative Arts Therapy Candidate, talks with women of color about depression, anxiety, trauma, mental illness, self-care and self-compassion. Jennifer shares her experiences with mental illness and offers tips to help women of color thrive.
- **The Evolving Chair: T**he Evolving Chair Podcast is hosted by Millennial Lakiesha Russell, Licensed Professional Counselor (LPC), whose passion is dispelling the myth about mental health and therapy. She will chat with others who share their expertise, personal stories and more to help us all EVOLVE into our best self by encouraging physical, spiritual and mental wellness.
- **The Mindful Muslim:** A discussion on mental health, psychology, Islam and spirituality featuring mental health professionals.