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Self-managed Contraceptive Care: Using Human-Centered Design to Enhance Contraceptive Services for Young Women at the Grady Health System Teen Services Clinic

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Abstract

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Background. Young women in the United States face multiple barriers to accessing effective contraception in clinical settings. The COVID-19 pandemic has exacerbated these barriers, but it has also rapidly advanced innovation in health care and opened the door for novel approaches, like self-care. The Grady Health System Teen Services Clinic in Atlanta, Georgia provides youth-centered contraceptive services for low-income and uninsured young women. The COVID-19 pandemic changed the way the Teen Services Clinic delivers contraceptive care. While some changes may be temporary, new services that give young women more autonomy, such as telehealth and home delivery of prescription contraceptives, may have enduring value. This thesis project aims to identify opportunities for self-managed contraceptive care that can enhance sexual and reproductive health services at the Teen Services Clinic and increase patient autonomy.

Methods. Qualitative research and data analysis were used in combination with human-centered design methods. Results from interviews with clinic staff and young women were used to develop an initial set of design concepts. Participants were then engaged in collaborative design sessions to expand on the design concepts and prioritize ideas for further development.

Results. Results from qualitative research highlighted the need for emotional and practical support throughout the contraceptive care journey. Design concepts for emotional support explore opportunities to build individual confidence and cultivate supportive relationships at home and among the clinic community. Concepts for practical support explore opportunities to promote learning and clarify individual responsibilities during clinic visits, as well as extending reproductive health services and education beyond the clinic setting. Concepts and ideas prioritized by both clinic staff and young women offer reliable information on demand that reflects young women's voices and values, delivered in a format that is easy to access and share.

Recommendations. This thesis project addresses an important first step in developing contraceptive self-care interventions. However, more work is needed to further develop prioritized concepts. It is recommended that clinic staff and young women continue to be engaged as collaborators to explore content, delivery models, and opportunities to integrate with the MyChart patient portal app.

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Contents

1. Introduction

1.1 Background

Childbearing by teenagers continues to be a pertinent public health concern. In the United States (U.S.) over 75% of pregnancies among teenagers ages 15–19 are unintended (Finer & Zolna, 2016), leading to abortion, poor social and health consequences for teen mothers and their children, and high public costs. While national teen birth rates have declined substantially in recent years, the U.S. is still far behind other industrialized nations, and racial and geographic disparities in teen birth rates persist. Black teens, particularly those in the South and Southwest, have higher birth rates than teenagers in other racial and ethnic groups (Hamilton, 2020; Kost, Maddow-Zimet, & Arpaio, 2017).

Unintended pregnancy among teens overwhelmingly results from not using contraception or from not using effective methods correctly or consistently (D'Angelo, Gilbert, Rochat, Santelli, & Herold, 2004). Condoms are the most commonly used contraceptive method among teens, followed by birth control pills (Abma & Martinez, 2017), both of which are challenging to use correctly and consistently. Long-acting reversible contraceptives, specifically the implant and intrauterine devices, are the most effective reversible methods available (Kowal et al., 2018). However, they are some of the least commonly used methods, particularly among younger women and black women (Abma & Martinez, 2017; Dehlendorf et al., 2014). Teens' nonuse of effective contraception may be driven by many factors, including lack of access, lack of awareness of available services, concerns about confidentiality, and real or perceived cost barriers (Copen, Dittus, & Leichliter, 2016; Fuentes, Ingerick, Jones, & Lindberg, 2018).

The COVID-19 pandemic has further restricted teens' access to and use of contraception. At home, the pandemic has brought about dramatic social and economic changes, including periods of shelter-in-place requirements, widespread school closures, increased engagement with parents, and growing financial insecurity. It has also disrupted teens' access to affordable and confidential sexual and reproductive health services (Lindberg, Bell, & Kantor, 2020). Many family planning providers have been forced to limit in-person visits and defer new patients to minimize risks to patients and staff. Additionally, teens may avoid obtaining in-person care for fear that they or a family member may be exposed to the virus. Such circumstances create barriers for initiating contraceptive use and maintaining correct, consistent use among teens already using a method.

On the other hand, the COVID-19 pandemic has also rapidly advanced innovation in health care, in particular, telehealth services and online platforms for contraception. Family planning providers have used telehealth in new ways to continue providing sexual and reproductive health care, such as offering remote contraceptive counseling and screening for sexually transmitted infections. Many providers have also incorporated home delivery and drive-up services for contraceptives. And for patients who cannot leave home or access contraception from their usual provider, there is an increasing number of online telemedicine platforms that prescribe hormonal contraception for home delivery. The rapid development of these services has demonstrated our capacity to adopt novel approaches to health care, particularly contraceptive care, in the U.S.

Self-care interventions are among the most promising novel approaches to improving reproductive health and well-being (World Health Organization, 2019). Research has demonstrated that when people are active participants in their own health care, adherence to medication and treatment regimens improves (Levinson, Lesser, & Epstein, 2010). In low resource settings, self-care interventions, such as self-administered contraceptive injections have been shown to help marginalized populations access contraception and reduce barriers to care (Spieler, 2014). Contraceptive self-care interventions have also been introduced in the U.S., including online services that prescribe hormonal contraception for home delivery (e.g., Nurx, The Pill Club). However, these services cater to adult women and experienced contraceptive users and operate outside of traditional health systems. Little is known about how self-care interventions could support contraceptive access and use among U.S. teens.

1.2 Problem

The Grady Health System Teen Services Clinic in Atlanta, Georgia provides youth-centered sexual and reproductive health care and counseling for adolescents and young adults. As a recipient of Title X federal family planning funding, the Teen Services Clinic is a significant source of contraceptive services for low-income and uninsured young women in the Atlanta area. The clinic also provides gynecological care, pregnancy testing, and sexually transmitted infection (STI) services.

The COVID-19 pandemic has changed the way the Teen Services Clinic delivers care. Clinic hours are limited, walk-in patients have been deferred, and telehealth services are used when possible. Curbside services and home delivery for prescriptions have also been provided. Some of these changes may be temporary, but changes that give patients more autonomy in their reproductive health care, such as telehealth and home delivery of prescription contraceptives, may have enduring value.

Providers at the Teen Services Clinic remain the gatekeepers of ongoing access to contraceptive services. This inherently limits patient autonomy and individual ownership of reproductive health care. **There is a need to empower young women to be more informed and effective managers of their own care.**

1.3 Purpose and Objectives

The purpose of this thesis project is to identify opportunities for self-managed contraceptive care that can enhance current services at the Teen Services Clinic and increase patient autonomy. The project uses qualitative research and human-centered design methods to identify opportunities and collaboratively develop design concepts that support both patients and providers.

Human-centered design is a process used to develop products or services that are responsive to people's needs and preferences. It seeks to rapidly move from insights to action by translating findings into concepts that can be tested, adapted, and improved in collaboration with key stakeholders. When employed in conjunction with traditional public health approaches, human-centered design can be a powerful tool for health care innovation.

Project objectives include:

- Explore the current landscape of self-managed contraceptive products and services available to young adults in the U.S.
- Assess contraceptive services at the Teen Services Clinic and identify opportunities to integrate self-managed solutions
- Identify barriers and facilitators to accessing contraceptive education and services from the perspectives of patients and providers

- Develop and test initial concepts for self-managed contraceptive care in collaboration with patients and providers

1.4 Significance

This thesis project provides user-driven solutions to enhance reproductive health care at the Grady Health Systems Teen Services Clinic and improve contraceptive access and use among under-served young women in the Atlanta area. Additionally, it contributes to evidence related to self-care interventions for sexual and reproductive health care and demonstrates the utility of human-centered design approaches for health care innovation.

1.5 Definition of Terms

Human-centered design	A process for creative problem-solving that starts with people and ends with innovative solutions that are tailor-made to suit their needs (IDEO.org, 2015).
Self-care	The ability of individuals, families, and communities to promote health, prevent disease, maintain health, and cope with illness and disability with or without the support of a healthcare provider (World Health Organization, 2019).

Telehealth	Refers broadly to electronic and telecommunications technologies and services used to provide care and services at a distance (Office of the National Coordinator for Health Information Technology, 2019).
Telemedicine	A sub-set of telehealth in which a physician in one location uses a telecommunications infrastructure to deliver care to a patient at a distant site (Office of the National Coordinator for Health Information Technology, 2019).
Unintended pregnancy	A pregnancy that is either unwanted, such as the pregnancy occurred when no children or no more children were desired; or the pregnancy is mistimed, such as the pregnancy occurred earlier than desired (Centers for Disease Control and Prevention, 2019).

2. Literature Review

2.1 Teen Pregnancy

Childbearing by teenagers continues to be a pertinent public health concern. In the U.S. over 75% of pregnancies among teenagers ages 15–19 are unintended (Finer & Zolna, 2016), leading to abortion, poor social and health consequences for mothers and their children, and high public costs. While national teen birth rates have declined substantially in recent years, the U.S. is still far behind other wealthy nations, and racial and geographic disparities in teen birth rates persist.

Teen pregnancy and childbearing have immediate and long-term impacts on teen mothers and their children. Teen mothers have lower educational attainment, fewer socioeconomic opportunities, and worse health outcomes compared to their counterparts who delay motherhood (Patel & Sen, 2012). Children of teenage mothers are at increased risk of pre-term delivery, low birth weight, and neonatal mortality (Chen et al., 2007). Later in life, they are more likely to have lower school achievement, have more health problems, and become a teenage mother themselves (Hoffman & Maynard, 2008).

On a positive note, the teen birth rate has fallen continuously since peaking in the early 1990s, from 61.8 per 1,000 live births in 1991 to 22.3 in 2016 (Hamilton & Mathews, 2016). In 2018, the teen birth rate fell even further to 17.4 per 1,000 live births, a historic low (Hamilton, 2020). These declines have been observed nationwide and among all racial and ethnic groups. Progress has also been observed among adult women. For the first time since 2001, the rate of unintended pregnancy among women in their 20s is declining—between

2008 and 2011, unintended pregnancies declined 22% among women ages 20–24 and 13% among women ages 25–29 (Finer & Zolna, 2016).

Still, the U.S. is far behind; rates of teen pregnancy in the U.S. remain substantially higher than in other wealthy countries, despite similar rates of sexual activity. By comparison, the U.S. teen pregnancy rate is over four times that of the Netherlands (14) and over twice that of France (25) (Sedgh, Finer, Bankole, Eilers, & Singh, 2015). Additionally, the overall rate of unintended pregnancy in Western Europe is 40% lower than the rate in the United States (Sedgh, Singh, & Hussain, 2014). Nearly half of all pregnancies in the U.S. are unintended (Finer & Zolna, 2016).

Moreover, significant disparities in teen birth rates among minority groups and young women living in poverty have persisted and vary widely by region. Non-Hispanic Black teens, particularly those in the South and Southwest, have higher birth rates than teenagers in other racial and ethnic groups (Hamilton, 2020; Kost et al., 2017). While teen birth rates have declined for all groups of teens, the birth rate is over twice as high among Hispanic teens (28.9) and non-Hispanic Black teens (27.5) as compared with non-Hispanic White teens (13.2) (Hamilton, 2020).

2.2 Contraception: Barriers to Access and Use

Teen birth rates have been steadily declining across the U.S. primarily because teens are becoming better contraceptive users. This trend is demonstrated by data from several rounds of the National Survey of Family Growth (NSFG). Analyses of NSFG data from 1995 and 2001 indicate that 86% of the decline in teen pregnancy during this period was the result of improved contraceptive use, particularly increased use of condoms, birth control pills, and multiple methods, and a substantial decline in non-use (Santelli, Lindberg, Finer, & Singh, 2007). The remaining 14% of the decline could be attributed to a decrease in sexual activity(Abma & Martinez, 2017).

Likewise, most unintended pregnancies result from not using contraception or from incorrect or inconsistent use of effective methods. Condoms and birth control pills are two of the most commonly used methods among teens (Abma & Martinez, 2017), both of which are challenging to use correctly and consistently. While condoms are the only method of contraception that can also prevent sexually transmitted infections, they are one of the least effective methods for preventing pregnancy with typical use (Sundaram et al., 2017). Birth control pills are also less effective at preventing pregnancy compared to other methods. Long-acting reversible contraceptives (LARCs), including the implant and intrauterine devices, are the most effective reversible methods of contraception available and require no effort to use after they have been placed (Kowal et al., 2018). However, LARCs are also some of the least commonly used methods of contraception, particularly among teens; of U.S. teens using any method, only 4.3% use LARCs (Abma & Martinez, 2017).

One reason for such low uptake is that hormonal methods often require both a provider and pharmacy visit. These are significant barriers for those who may not have transportation or money, or who may want to keep their sexual behavior and contraceptive use confidential. The Contraceptive CHOICE Project, one of the largest prospective cohort studies of women in the U.S. seeking reversible contraception, found that when the barriers of access, cost, and knowledge are removed, women choose the most effective and least user-dependent methods (Secura et al., 2014).

2.3 COVID-19 Pandemic: Impact on Contraceptive Care

2.3.1 Impact on reproductive health care

The COVID-19 pandemic has further restricted teens' access to and use of contraception. At home, the pandemic has brought about dramatic social and economic changes, including periods of shelter-in-place requirements, widespread school closures, increased engagement with parents and relatives, and growing financial insecurity. It has also disrupted teens' access to affordable and confidential sexual and reproductive health services (Lindberg, Bell, et al., 2020).

Many family planning providers have been forced to limit in-person care and defer new and walk-in patients to minimize risks to patients and staff (Keller & Dawson, 2020). Additionally, teens may avoid in-person care for fear that they or a family member may be exposed to the virus. In a recent Guttmacher Institute survey, one in three women (33%) reported that they had to delay or cancel reproductive health care or had trouble getting contraception because of the pandemic (Lindberg, VandeVusse, Mueller, & Kirstein, 2020). Finally, teens' ability to obtain confidential and private reproductive health care may be also hampered. With school closures and social distancing measures, young people are spending more time at home with parents and other relatives. This limits teens' ability to access care discreetly or speak privately with providers during telehealth visits conducted at home (Lindberg, Bell, et al., 2020).

Providers have expressed concern about the pandemic's impact on the sexual and reproductive health of young people. Clinical practice groups have asserted that providing contraception and reproductive health care during a pandemic is essential. The North American Society for Pediatric and Adolescent Gynecology stated unequivocally that "reproductive health care is an essential component of health care and adolescents need access to reliable contraception during a pandemic" (Tyson et al., 2020). Wilkinson, Kottke, and Berlan (2020) share this position and provide a detailed algorithm for providing contraception to young people during the pandemic. Other organizations including the Centers for Disease Control and Prevention, National Family Planning and Reproductive Health Association, and Reproductive Health Access Project have also issued recommendations for providing contraceptive services in the time of COVID-19.

2.3.2 Health care innovation

While the pandemic has indeed disrupted access to contraception and sexual and reproductive health services, it has also rapidly advanced innovation in health care, particularly, telehealth and online services. During the last week of March 2020—about one month after the first reported community spread of COVID-19 in the U.S.—telehealth visits increased 154% compared with the same period in 2019 (Koonin et al., 2020). Additionally, the Centers for Medicare & Medicaid Services (2020) issued guidance for expanding telehealth services and waived regulations to make it easier for providers to offer telehealth services. Family planning providers have used telehealth in new ways to continue providing sexual and reproductive health care, such as offering remote contraceptive counseling and STI screening. Many also provide home delivery or drive-up services for medications and medical supplies, such as contraceptive refills and at-home STI tests (Keller & Dawson, 2020; Ranji, Frederiksen, & Salganicoff, 2020). Online services have also increased. Individuals who cannot leave home or access contraception from their usual provider or pharmacy can obtain hormonal contraception from online telemedicine platforms, like Lemonaid Health or Nurx. The rapid development and expansion of these new services and supporting health policies have demonstrated our capacity to adopt novel approaches to health care in the U.S.

2.4 Self-care Interventions for Sexual and Reproductive Health

2.4.1 What is self-care?

Self-care interventions are among the most promising novel approaches to improving health and well-being (World Health Organization, 2019). The World Health Organization defines self-care as "the ability of individuals, families, and communities to promote health, prevent disease, maintain health, and cope with illness and disability with or without the support of a healthcare provider" (2019). While self-care is not necessarily a new concept, new approaches and advancements in medicine and technology have expanded the reach of self-care to a wide range of health areas, from mental health to managing chronic disease. Furthermore, research has shown that when people are more engaged in their own health care, adherence to medication and treatment improves (Levinson et al., 2010).

Self-care can be especially transformative for sexual and reproductive health. As Narasimhan (2019) and colleagues argue, "the deeply personal nature of sexual and reproductive health, which is often affected by social, cultural, and legal barriers to accessing support or services, means that self-care can empower and enable people to manage their health in ways that are often beyond the reach of the health system". In low resources settings, self-care interventions have been shown to help marginalized populations access contraception and reduce barriers to care (Spieler, 2014). New devices, diagnostics, and digital health services are transforming the way people interact with health systems and manage their own care.

2.4.2 Self-care interventions for reproductive health

One such device, subcutaneous depot medroxyprogesterone acetate (DMPA-SC), is a new form of injectable contraception that can dramatically expand access and choice. While injectable contraception is already widely used, it is primarily delivered as an intramuscular injection, administered by a clinician. DMPA-SC is a prefilled, single-dose drug and needle combination that requires a much simpler injection just below the skin. It is uniquely suited for self-injection or delivery by community-based health workers and pharmacists. Research shows that DMPA-SC is safe and effective (Dragoman & Gaffield, 2016) and can improve contraceptive access, continuation, and autonomy across diverse settings (Kohn, 2018). Globally, millions of women and girls are using DMPA-SC, and 54 countries have approved DMPA-SC for self-injection, including the United States (PATH, 2019).

In addition to new devices, like DMPA-SC, new diagnostics and digital health tools are also being used to support self-care. Self-sampling kits have increased coverage of human papillomavirus (HPV) testing in low resource settings (Ogale, Yeh, Kennedy, Toskin, &

Narasimhan, 2019). HPV testing is an effective method of cervical cancer prevention; however, it is typically performed by clinicians during a pelvic exam. Self-sampling offers flexibility for how and where women collect their samples. Studies have shown that women who took their own samples were twice as likely to accept HPV testing (Ogale et al., 2019).

Digital health tools, including mobile services and new telemedicine technology, are also being used for self-care. This is has been fueled, in part, by the expansion of mobile phones, smartphone applications, and internet access globally (Self-Care Trailblazer Group, 2020). Digital health tools can function as the delivery mechanism or the intervention itself, as with fertility monitoring apps. Population Services International has developed several digital health tools for contraceptive self-care, such a JoJo, a WhatsApp-based contraceptive support service that connects young women in Nairobi, Kenya with clinicians through live chat.

Contraceptive self-care interventions are also being used in the United States. DMPA-SC, known as Depo-subQ in the U.S., has been increasingly prescribed for self-injection during the COVID-19 pandemic (Frederiksen, Gomez, & Salganicoff, 2020). Online and app-based telemedicine platforms have also expanded. As described above (section 2.3), individuals can obtain hormonal contraception from services such as Lemonaid Health or Nurx. Most of these platforms use a questionnaire or video consultation to determine an individual's medical eligibility and contraceptive preferences. The prescribed method is either mailed or sent to a nearby pharmacy for pick-up. A recent review conducted by the Kaiser Family Foundation identified over 25 unique online contraception and STI service platforms (Frederiksen et al., 2020). These online platforms offer convenience, privacy, and increased autonomy; however, they cater to adult women and experienced contraceptive users. Specifically, contraception is limited to user-dependent methods (the pill, patch, ring, and emergency contraception); there are no referrals for LARC options; provider counseling is limited; there are age restrictions for teens; and a debit or credit card is required for payment. Little is known about how self-care interventions, such as these online telemedicine platforms, could support contraceptive access and use among U.S. teens.

It is also worth noting that these platforms were not necessarily designed with teens in mind, as they are not the primary audience. Capturing and incorporating the experiences and perspectives of individuals who may use self-care interventions is critical to the development of successful products and practices (Murray, Brady, & Drake, 2017). This is where human-centered design can be a powerful tool.

2.5 Human-centered Design and Health

2.5.1 What is human-centered design?

Human-centered design (HCD) is a process used to develop products or services that are responsive to users' needs, preferences, and the broader context in which they live. It is described as both a creative mindset and a skillset in which users inform and participate in the design process (Design for Health, 2019; Ku & Lupton, 2020). Human-centered design is also referred to as design thinking and user-centered design. While these terms have different origins, they all describe a process for creative problem solving and a marked deviation from design as merely an aesthetic practice.

The HCD process is described in many different ways, but most approaches consist of three key phases: inspiration, ideation, and implementation (Brown, 2008). *Inspiration* includes defining and understanding the problem or opportunity. The core component of this phase is building a deep and well-rounded understanding of users' needs and behaviors and the social context in which they operate. This often includes qualitative research, such as interviews, focus group discussions, and direct observation, with an emphasis on building empathy. *Ideation* is the process of generating and testing ideas. Data collected through research activities is distilled into insights that can lead to new solutions or opportunities for change. This process, often referred to as "synthesis", includes identifying themes across different types of data, sorting these themes into groups, and describing key insights into users' needs and behaviors. Insights are then translated into potential solutions, with an aim to generate as many ideas as possible. *Implementation* is the process of validating and delivering effective solutions at scale. This includes creating prototypes of products or experiences (e.g., physical models, storyboards) that are tested, iterated, and refined in collaboration with users and other key stakeholders. The aim is to quickly identify and correct issues before building out a full solution. In the end, effective solutions are further refined and implemented at scale.

This approach can be applied in various ways, ranging from a full end-to-end process to a spark for new ideas (Brown, 2008; Cherney, Holt, Lee, & Sun, 2019; Design for Health, 2019). It is also worth noting that while these phases are often presented as a linear flow, the design process involves multiple cycles of iteration—revisiting opportunities and ideas as new insights emerge throughout the process.

2.5.2 Human-centered design in health

Human-centered design has been used to enhance health products and services for many years (Ku & Lupton, 2020). Companies like Philips and GE employ designers to create products that improve patient experiences. And health care providers, like Kaiser Permanente and the Mayo Clinic, have internal design teams that use HCD principles to improve patient care.

More recently, human-centered design has been used to address complex global health challenges. According to Design for Health, more than 35 major global health projects have "used design as an essential component" (2019). Global nonprofit organizations, like Population Services International, have collaborated with designers to develop innovative health services (e.g., Adolescents 360). Other organizations, such as UNICEF and the International Rescue Committee, have hired design teams to build their internal capacity. And leading funders, such as the United States Agency for International Development and the Bill & Melinda Gates Foundation have invested in HCD as a tool to strengthen their global health work.

2.5.3 The value of human-centered design

There are many reasons for the expansion of design in health, but two factors have been especially powerful: participation and iteration. Melinda Gates, a co-chair of the Bill & Melinda Gates Foundation, said, "When you let people participate in the design process, you find that they often have ingenious ideas about what would really help them. And it's not a onetime thing; it's an iterative process" (Roper, 2013). Human-centered design is fundamentally inclusive and collaborative. Users are regarded as experts on their own lives. They are "active participants and creators of knowledge, not passive subjects to be measured and manipulated" (Ku & Lupton, 2020). The design process also "seeks to rapidly move from insights to action by translating learning into concepts that can be tested, adapted, and improved directly with end-users" (Design for Health, 2019). This approach helps uncover and address any issues before implementation and ensures that users' needs and preferences remain at the heart of product development.

Human-centered design also offers effective tools for describing health challenges. Models, such as user journey maps, are particularly useful for exploring complex and intangible issues, such as how individuals experience a health service (Kolko, 2015). Journey mapping combines storytelling and visualization to create a holistic view of the user experience (Kaplan, 2016). While maps can take a variety of forms, certain elements are generally included: the main actor in the journey (i.e. the user); the specific scenario and its phases; the behaviors, needs, and emotions of the main actor throughout the journey; and the challenges experienced by the main actor (Kaplan, 2016). Journey maps have helped providers like the U.S. Department of Veteran Affairs better understand patient experiences and improve care (Maddox, Baggetta, Herout, & Ruark, 2019). This tool, along with other design models presents an alternative way of looking at common problems.

When employed in conjunction with traditional public health approaches, human-centered design can be a powerful tool for health care innovation. It is also uniquely suited to identify opportunities for contraceptive self-care solutions. Brindis (2020) and colleagues argue that teen pregnancy prevention efforts should be tailored to adolescent needs, incorporate their perspectives, and be driven by principles of equity and inclusion. And Narasimhan (2019) and colleagues point out that “although it is tempting to focus on new digital or physical innovations that facilitate self-care, it is important to remember that the needs of individuals, and communities, are at its heart”. These are all key principles of human-centered design.

3. Methodology

Qualitative research and data analysis were used in combination with human-centered design methods to identify contraceptive self-care solutions for the Teen Services.

3.1 Population

Young women and clinic staff were recruited from the Grady Health Systems Teen Services Clinic. The primary population (target users) was young women, aged 14–19 who access health care from the Teen Services Clinic, currently using a method of hormonal contraception. The secondary population was providers, nurses, and health educators at the Teen Services Clinic who provide contraceptive care and counseling to the primary population and support the implementation of new reproductive health services.

Participants from both the primary and secondary populations were recruited for in-depth interviews and collaborative design sessions.

- **In-depth interviews:** Nine young women from the primary population were recruited; seven clinic staff were from the secondary population were recruited—three providers, one nurse-midwife, two health educators, and one research coordinator

- **Collaborative design sessions:** Six young women from the primary population recruited, two of whom participated in in-depth interviews; three clinic staff were also recruited—one clinician, one nurse-midwife, and one health educator, all of whom participated in in-depth interviews

3.2 Procedures

The project included three distinct phases: Preparation, Data Collection, and Analysis and Design. Each phase was designed to build on findings and outputs from the previous phases.

3.2.1 Preparation

This project began with an assessment of the current landscape of products and services related to contraceptive self-care. This included an internet search for existing self-care products as well as other services and tools that provide information on available contraceptive methods and guidance on method selection and use. Several products and resources were incorporated into qualitative research activities during Data Collection for participant feedback. The Preparation phase also included developing and pre-testing qualitative research instruments with project staff. Instruments were then refined for clarity and efficiency.

3.2.2 Data Collection

During this phase, qualitative research activities, including in-depth interviews and a group brainstorm, were conducted with young women and clinic staff.

Recruiting: Clinic staff were introduced to the project during a scheduled morning meeting by the clinic lead. Additional information was shared via email. Staff were then contacted individually via email with a request for an interview. Young women were recruited directly from the clinic. Staff informed patients about the project during a clinic visit. Respondents were interviewed following their clinic visit after providing informed consent.

In-depth Interviews, Clinic Staff: The first round of in-depth interviews was conducted with providers and health educators from the Teen Services Clinic. The objective of these interviews was to understand contraceptive services provided by the Teen Services Clinic and identify opportunities to support patient care with a self-care service. Due to the COVID-19 pandemic, in-depth interviews with staff were conducted using the teleconference application, Zoom. Each interview lasted approximately 45 minutes.

Journey Map Brainstorm: In-depth interviews were followed by a group brainstorm activity with clinic staff. This semi-structured activity was conducted in-person with interview participants and additional members of the clinic staff (seven participants in total).

Brainstorm participants mapped patient needs and challenges related to contraceptive use across the different phases of the contraceptive journey and discussed opportunities for support and self-care services.

In-depth Interviews, Young Women: In-depth interviews were then conducted with young women to understand their needs, challenges, and beliefs regarding contraceptive methods and care. Discussion guides were edited to include probes on specific topics that arose during qualitative research activities with clinic staff. In-depth interviews with young women were conducted in a private room in the Teen Services Clinic in adherence to COVID-19 safety protocols, including masking and social distancing. Each interview lasted 30–45 minutes.

3.2.3 Analysis and Design

Following data collection, rapid analysis was conducted to identify initial ideas and opportunities for self-managed contraceptive care. These opportunities were translated into a set of design concepts. Participants from the Data Collection phase were then engaged in collaborative design sessions to expand on design concepts and prioritize ideas for further development. During these sessions, participants provided feedback on each concept. They were also prompted to elaborate on suggested improvements or additions and expand on new ideas that arose. These sessions were conducted with young women and clinic staff via Zoom or in-person at the Teen Services Clinic in adherence to COVID-19 safety protocols.

3.3 Instruments

3.3.1 In-depth Interviews

Discussion guides were developed for in-depth interviews with clinic staff and young women. Initial drafts were reviewed by the clinic lead and thesis chair, then pre-tested with a clinic administrator and the clinic lead. Following review and pre-testing, minor adjustments were made to the content. The discussion guide for clinic staff covered several topics, including:

- Role at the Teen Services Clinic,
- The goals and unique value of the Teen Services Clinic,
- Patient needs and challenges, and
- Strategies used to engage with patients about sexual and reproductive health care.

Interviews with clinic staff and the subsequent group brainstorm helped to identify specific probes for patient interviews including parent influence, partner influence, and switching methods. These probes were integrated into the discussion guide for young women, which covered several topics:

- Experience and value of the Teen Services Clinic,
- Needs and challenges related to contraceptive use,
- Sources of influence and information, and

- Preferences for self-care options.

Audio recordings were captured for all interviews. The Zoom recording feature was used for all remote interviews. In-person interviews were recorded with Voice Notes for iPhone SE.

3.3.2 Journey Map Brainstorm

A blank, banner-sized journey map was used for the brainstorm. The map included columns to delineate key phases of the contraceptive journey: motivation, awareness, access, first use, continued use, and switching or stopping use. Each phase was labeled with a brief description and a narrative from the patient perspective (e.g., First Use: Initiating a contraceptive method for the first time | *She chooses Depo-Provera and gets her first injection*). Participants used green and pink-colored Post-it notes to map patient needs and challenges related to contraceptive use across the different phases of the journey. After reviewing the map as a group, participants noted opportunities or specific ideas that could address the needs and challenges raised. The completed journey map was documented in photographs and summarized in notes according to the same framework.

3.3.3 Collaborative Design Activities

Preliminary design concepts that emerged from data analysis were visualized using simple digital design tools (e.g., Adobe Photoshop and Microsoft PowerPoint). Each visualization included a concept name and a brief text description. Key questions and considerations were noted on each concept for exploration during collaborative design sessions.

3.4 Data Analysis

Data were analyzed in two stages. The first stage of analysis covers data gathered from qualitative research during Data Collection. The second stage of analysis covers output from collaborative design activities conducted during Analysis and Design. Results from the first stage of data analysis informed initial design concepts.

3.4.1 Stage One, Qualitative Research

Audio recordings from in-depth interviews were uploaded to Happy Scribe, an automatic transcription software. The transcripts generated by Happy Scribe were reviewed for accuracy and de-identified. These data were entered into MAXQDA 2020, qualitative data analysis software (VERBI Software 1995–2020) where they were labeled with deductive codes based on discussion guide topics, as well as several inductive codes that arose from the data.

During an initial reading of the transcripts, I wrote memos on interesting ideas and opportunities to explore in collaborative design activities. These memos were then incorporated into the journey map model, building on concepts uncovered during the group brainstorm session. I then systematically reviewed coded segments by individual code, again writing memos that captured challenges, themes, and design opportunities. Coded segments were reviewed in two groups: clinic staff and young women. This approach allowed for the quick capture of ideas and concepts to further explore during collaborative design sessions and a thorough analysis of qualitative data.

3.4.2 Stage Two, Collaborative Design Sessions

Feedback for each concept was assessed according to strengths, weaknesses, and enhancements. Practical considerations for concept development and implementation were also assessed. As with Stage One of data analysis, these data were reviewed in two groups: clinic staff and young women.

3.5 Ethical Considerations

Submission for institutional review board (IRB) approval was discussed by the thesis committee. A Research Determination Form was submitted to the Emory IRB, and the thesis project was determined to be “not research”. All participants were required to sign an informed consent before participation in any activities and received a $20 Amazon e-gift card for their time.

3.6 Limitations

Participants from the primary population were recruited through convenience sampling. While selection criteria were used, participants represented patients of the Teen Services Clinic who had the time and personal motivation to participate in an interview following a routine clinic visit and may not accurately represent the general patient population of the Teen Services Clinic. Additionally, interviews conducted with the primary population varied in duration and depth depending on participants' availability. Finally, collaborative design sessions focused primarily on gathering verbal feedback rather than adapting concepts in a more tangible and constructive manner. Human-centered design methods typically emphasize co-creation over simply incorporating participant feedback.

4. Results

The following sections reflect findings from iterative data analysis. Findings incorporate data gathered from both populations (young women and clinic staff) during qualitative research activities and collaborative design sessions.

4.1 Challenges, Themes, and Opportunities Across the Patient Journey

Journey maps can be used to capture and analyze a product or service experience "as is". They can also be used to propose a possible product or service "to be". This section (4.1) incorporates both of these approaches. The current contraceptive care experience at the Teen

Services Clinic is described according to *Challenges* and *Supporting Themes.* Possible self-managed contraceptive care solutions are proposed as *Design Opportunities.*

4.1.1 Motivation: "Feeling the need for contraception"

Challenge

Feeling the need for contraception was not necessarily clear or straightforward, especially when young women were not yet sexually active or for those who only had a few chance encounters. Young women described receiving mixed messages about contraception. In some cases, mothers pushed contraceptive use. In contrast, other family members and peers discouraged use, repeating common myths or warning of severe side effects. As a result, the desire to avoid pregnancy did not always align with sexual behaviors and contraceptive use.

Supporting Themes

Future-focused: Young women described ambitious goals for the future and the desire to delay pregnancy. Most included plans for higher education followed by a prestigious career. Young women also described a desire for financial independence. Five out of seven participants had a part-time job and one started her own resale business. Notably, marriage or starting a family was not discussed. Only one participant mentioned marriage, with the clarification that she would only consider it after completing higher education and extensive professional training. Early or unplanned pregnancy was described as a barrier to achieving these goals.

Parent influence: In some cases, mothers introduced the idea of contraception or pushed young women to start a method. In contrast, mothers also perpetuated myths or misinformation about contraception and discouraged use. In either case, mothers were described as a dominant voice in young women's consideration of contraception. This phenomenon was described by young women and clinic staff alike.

Misconceptions: Misinformation and warnings about side effects were often echoed by peers. Young women described stories from friends and classmates that shaped their initial perception of contraception. Weight gain, heavy bleeding, or loss of fertility were reported as common warnings from peers. One participant described a view among her peers that contraception was "nasty" because it could interrupt regular menses, which was believed to be cleansing:

> I don't know. I heard it from my friends. They was like, 'Birth control is nasty, because your period, it cleans out your body.' So they was like, 'It's nasty to not get your period.' So, that's why I didn't really want to be on it at first. (YW-06, age 17)

Mixed motivation: Clinic staff estimated that about half of patients visit the clinic for contraception. The other half seek STD screening or a "check-up", and in many cases, contraception comes up during the visit. Only two out of seven participants reported visiting the Teen Clinic for contraception specifically. Clinic staff also described inconsistencies between patients' sexual behaviors and contraceptive use, such as coming in for multiple pregnancy tests with the hope of a negative result, yet refusing to use contraception. In some cases, clinic staff helped patients connect the dots and guided them toward an appropriate method. Other patients were not ready or simply unwilling to use contraception.

Design Opportunity

Connect contraceptive use to immediate sexual health concerns (e.g., safeguarding against unexpected or unprotected sexual encounters) and achieving future goals. Leverage the power of peer voices to share relatable, accurate stories about contraceptive use that counteract misinformation.

4.1.2 Awareness: "Learning about the options for contraceptive care"

Challenge

The Grady Teen Services Clinic is considered a "hidden gem," which is not necessarily a good thing. Both young women and clinic staff described barriers to clinic awareness, including a lack of youth-friendly marketing. Even patients who were referred by family members or other trusted sources were initially uncertain about the services available and associated the clinic with shameful sexual health issues or the need for treatment.

Supporting Themes

Family connection: More than half of young women reported that family members (e.g., mom, sister, aunt) are trusted sources for information and advice related to sex, relationships, and sexual health. And in most cases, one of these family members provided an introduction to the Teen Services Clinic. Both young women and clinic staff discussed the power of the Grady community, describing how multiple generations had been born at Grady Hospital ("Grady babies") and continued to utilize the Grady Health System for individual and family care. Referrals from friends and peers appeared to be less compelling. When asked, all young women reported that they would recommend the Teen Services Clinic to others. They also noted, however, that they would only refer close friends or partners with a specific health need (e.g., pregnancy test). In their experience, general referrals to other peers were often met with skepticism:

> But they don't believe that I come up here by myself, because they are so used to going to doctors with their parents. I said you are able to go downtown to Grady Teen Clinic and get checked up for yourself. They don't believe me. They say, 'Uh uh, you lying. You can't go up there by yourself.' (YW-03, age 15)

Outside of direct referrals or an inborn connection to the Grady Health System, the Teen Services Clinic is largely hidden from public view.

Diagnosis and treatment: Some young women initially associated the Teen Services Clinic with shameful sexual health issues or the need for treatment. It was described as a place to go when there is something wrong. For most participants, this view was validated during their first visit.

> When someone say you got to go to the clinic, I was like, 'Oh, I got something.' And it was true. That's all I could think. Always, when they talk about the clinic, like, 'Well, maybe cause you got HIV/AIDS, chlamydia, something that.' And it actually be true. (YW-04, age 18)

Four out of seven young women described first learning about the Teen Services Clinic when there was an uncomfortable health issue to address (e.g., urinary tract infection, STD exposure). In two cases, young women were referred from a primary care provider. Others had a more preventative framing and described the clinic as a resource to get a check-up and "make sure everything is good". In either case, young women's view of the Teen Services Clinic evolved after their first visit. Participants described feeling heard, supported, and understood by the clinic staff.

Design Opportunity

Reach young women with clear, consistent messaging about the value and service offerings provided by the Teen Services Clinic through familiar channels and interactions that they can relate to and trust.

4.1.3 Access: “Choosing the Teen Services Clinic for contraceptive care”

Challenge

Referrals and a strong Grady community help young women find their way to the Teen Services Clinic, but uncertainty about what to expect or how they will be treated can be stressful. Further, initiating a method of contraception is not always a priority. It may be secondary to STD screening or not a concern at all.

Supporting Themes

Accessibility: Both young women and clinic staff highlighted the accessibility of the Teen Services Clinic, including after-school and weekend hours, free care, and financial guidance. Staff expressed concern that it often takes a long time for patients to get through the clinic and described a need to improve efficiency. They also expressed a desire to expand clinic hours to ensure appointments do not interfere with school time. However, patients highlighted the clinic’s timeliness, stating that they could get in and out quickly, and the ease of scheduling appointments.

Safe space: Both young women and clinic staff highlighted confidentiality as a unique quality of the Teen Services Clinic. As a Title X-funded site, the clinic encourages parental involvement, but it is not required (Office of Population Affairs). Clinic staff reported that this policy empowers young women to seek care from the Teen Services Clinic. This was echoed by young women who described feeling more responsible without the need for direct parental involvement. Young women also emphasized feeling at ease and comforted by clinic staff. This was particularly important for STD care. Young women appreciated staff assurance that they were not at fault and that STDs can be easily treated.

> If you have a bad test result, they go talk to you about it, so you—they won't make you feel bad about it. They understand, sometimes it's not really your fault in particular. (YW-01, age 18)

Clinical procedures: Among all young women, tests and physical exams were equated with thorough, professional care and a sense that they had received a service. In two cases, this was contrasted with disappointing experiences at other healthcare facilities, in which young women were only assessed through a patient interview (i.e. no physical examination or diagnostics). Though not directly stated, young women implied that they had not shared full details with these providers, perhaps due to embarrassment or discomfort, and expected diagnostic tests and physical exams to fill in the blanks. The Teen Services Clinic provides initial STD screening for all new patients.

Design Opportunity

Address common questions and concerns in advance of clinic visits to build confidence and reduce anxiety during interactions with clinic staff.

4.1.4 First Use: "Initiating a contraceptive method for the first time"

Challenge

When initiating a method of contraception, young women are confronted with various influences, information, and uncertainty. It is a lot to process at once. Further, young women often lack the language to express individual needs or concerns related to contraception and sexual health. As a result, critical questions may go unanswered and instructions or information on what to expect is often forgotten.

Supporting Themes

Connection and trust: Clinic staff described the importance of building a partnership with patients rather than dictating their care. Likewise, young women described feeling comfortable with clinic staff and supported in decisions about contraception and sexual health. Staff described approaches for setting the tone and opening the door for patients to share freely. Such approaches included reminders of confidentiality, incorporating non-medical talk, and motivational interviewing. In turn, young women expressed gratitude for the staff's time and support to talk through tough issues, like processing an STD diagnosis or choosing a contraceptive method. Young women also emphasized feeling "unrushed". This was interpreted as an indication that clinic staff truly care about their wellbeing.

> Right, like the ring. That was not for me. But they made me see like, this [contraception] is for my protection and my own good. So it's better to do something that I'm comfortable with rather than do something that I'm like, iffy on doing. (YW-01, age 18)

Language limitations: Clinic staff described factors that affect communication with patients during clinic visits, including limited sexual and reproductive health language. Young women do not always know what to share or they may lack the vocabulary to articulate their needs or concerns. Participants also described a reluctance to disclose risky sexual behaviors unless asked directly. One provider suggested that preparation for clinic visits may help patients to overcome these barriers. Likewise, young women reported that technical explanations, such as details on a specific STD and how to treat it are both informative and reassuring. Simply naming and describing an STD assuages the fear and anxiety that come with a diagnosis.

Knowledge gaps: Clinic staff described a high prevalence of myths and misconceptions about contraception (e.g., loss of fertility, cause of cancer), which can influence young women's decisions about contraceptive use and method selection. Such misconceptions can be addressed to some extent, but there is a limit to what patients can absorb and remember in a single visit. Young women recalled that clinic staff had explained different methods. However, information about side effects and what to expect was less clearly understood. Most young women said that they would call the clinic with questions or concerns about contraceptive use or side effects. Some said they would ask a family member. However, none of the participants described a single, reliable resource for accurate information outside of Teen Services Clinic. Google and TikTok were the only resources mentioned.

Friend and family influence: None of the young women reported proactively seeking advice from friends. However, friends and other peers did influence perceptions of contraception and method selection. One young woman described her decision to use Nexplanon ("the implant") after a friend warned her of heavy bleeding caused by Depo-Provera ("the shot"). Family members had a similar influence. Several young women described choosing the implant because their mother or sister had used it. While such influence is not necessarily harmful, it can hinder young women from making decisions based on their own needs and preferences. Clinic staff reported that patients often want to use the same method as friends or family members, even if it is not necessarily the best option for them.

> Nexplanon. I was like, I want that one right there. Cause my mom told me about how she had it. My sister had it. And it helped, but you can get it removed anytime. But I don't want to get it removed. (YW-04, age 18)

Design Opportunity

Help young women to cut through the confusion and make confident and informed decisions about what is best for them. Provide tools to help young women build their reproductive health vocabulary and encourage dialogue with parents and partners to build support at home.

4.1.5 Continued Use: "Maintaining method use"

Challenge

Life is in constant flux, especially for young women served by the Teen Services Clinic. New circumstances (e.g., relationship changes, challenges at home) or uncomfortable side effects can arise at any time and disrupt contraceptive use or access to care. The Teen Services Clinic remains a steadfast source of guidance and support, but it is limited in its ability to serve patients outside of the clinic setting when challenges arise.

Supporting Themes

Education and guidance: In some ways, young women at the Teen Services Clinic are like adults. Clinic staff described how many patients have complex lives and experience trauma or abuse. As such, young women are forced to navigate heavy, adult issues at a young age. On the other hand, basic knowledge about sexual health and relationships is limited. As described by both young women and clinic staff, patients often go to the clinic with a general question about what is normal. Clinic staff provide practical information on everything from vaginal itching to STDs and contraception. They also act as guides to help young women translate knowledge into practice, such as working through challenging relationship scenarios or outlining a follow-up plan for care.

> I do think that there is a need for partnership in this, for helping them cultivate some very difficult things. Some of my approaches in a clinical setting are like, 'OK, you want to talk about condoms with your partner, let's do some role play. You maybe have never said any of these words out loud.' And to put that pressure on a 15-year-old to go and talk to her partner… I'll say this to teens, 'You don't think I'm cute. We have no relationship. I promise you, it's going to feel different and harder when you're actually talking in that real situation. So at least, let's practice some of the words.' (Provider, Teen Services Clinic)

Empowering patients: To support a balanced partnership, young women must be confident in making decisions about their care. Clinic staff described treating patients as young adults—providing some support without being overly accommodating. They act as guides, asking questions and presenting options to help young women make decisions. Clinic staff reported that this is a delicate balancing act, as they must avoid pushing what they think is best while helping young women make decisions that will keep them safe and healthy. To support this, staff reference information from neutral sources (e.g., contraceptive efficacy chart) and use motivational interviewing to help young women connect the dots and come to their own conclusions, such as discussing future goals in connection with preventing unplanned pregnancy.

Remote support: Young women and clinic staff also discussed interactions outside of the clinic, namely, telehealth and email or telephone communication. Participants described both the limitations and benefits of these remote support services. Clinic staff described telehealth visits, which started during the pandemic, as useful for straightforward interactions (e.g., prescription refill, routine check-up) but restrictive for others, particularly sensitive conversations or addressing emergent issues that require clinical care (e.g., laboratory tests). Young women also discussed the value of physical diagnosis (i.e. physical exams and diagnostic tests), which is not an option with telehealth. However, both young women and clinic staff described a desire for easy connection outside of the clinic. Young women reported feeling comfortable reaching out to health educators with questions or urgent needs. And staff reported challenges communicating through MyChart, the Grady Health System's patient portal. They expressed a desire for easier, more fluid communication, which could help resolve common issues without a clinic visit (e.g., bleeding changes).

Design Opportunity

Provide on-demand information and establish a reliable support system to help young women navigate unfamiliar or uncomfortable situations as they arise. Create a stronger link to the Teen Services Clinic to facilitate communication in-between clinic visits.

4.1.6 Switch or Suspend Use: "Discontinuing use or switching to a new method"

Challenge

There is limited tolerance for initial side effects or maintaining user-dependent methods. Young women are quick to switch methods due to discomfort or inconvenience. The Teen Services Clinic helps manage these transitions. However, when young women age out of the clinic, they may discontinue contraceptive use due to a disruption in care.

Supporting Themes

Learning from experience: Young women described personal experiences with side effects and method management that prompted a change in contraceptive use. The most common side effects reported were weight gain and bleeding changes. One participant experienced sudden weight gain and hair loss after initiating Depo-Provera. She switched to the implant after the second injection. Another participant also described a quick switch from Depo-Provera to the implant. In this case, she had missed an appointment and was concerned about her ability to keep up with the 3-monthly injections. Managing user-dependent methods was a concern for other participants as well. Four of seven participants were using the implant, citing their preference for a long-lasting method, as managing 3-monthly injections or daily oral contraceptives was difficult to fit into their busy lives.

> Well, the first birth control it was, I was getting the shot. I missed one of my appointments, so I started seeing that I'm not going to be able to have time to keep coming back up here to get shot after shot after shot every three months. So this time I made my appointment so I could come up here and get the implant instead, so it can last longer. And I don't have to worry about getting up, coming here to come get a shot. That's what made me actually change the birth control. (YW-03, age 15)

Preparation for adult care: Finally, clinic staff described an important ancillary benefit of self-managed contraceptive care: transferring some services to patients could better prepare young women for adult care, which necessarily requires greater self-sufficiency. Clinic staff described challenges with patient follow-through on referrals and drop-off after patients age out of the Teen Services Clinic. They felt that incorporating self-care options could help young women develop the skills and confidence needed to manage care from other providers and successfully transition to adult care.

Design Opportunity

Frame interruptions in contraceptive use as solvable challenges and encourage young women if they fall off track. Help young women maintain access to contraceptive care during points of transition, such as aging out of the Teen Services Clinic or moving to another location.

4.1.7 Other themes

STDs and partner communication: Sexually transmitted infections were a common concern among participants. Staff reported that while teen pregnancies have decreased, STDs have risen. All young women reported having at least one STD previously or were diagnosed with an STD on the day of their interview. Despite the prevalence of STDs, awareness among young women is low. Providers emphasized the need to counsel patients on STD prevention, which includes helping young women think through the cause of infection and what it might mean for a relationship. Young women described both the importance of using condoms to prevent STDs and the challenges to negotiating protection with partners. Discussions about STDs and condom use varied based on the nature of a relationship. In nascent or short-lived relationships, young women described condoms as the partner's responsibility. Conversely, decisions about birth control and "my body" were an individual choice and not up for discussion.

4.2 Design Concepts

Design concepts are used to illustrate a wide range of opportunities to reach target populations and explore potential product or service solutions. Opportunities that emerged from qualitative research activities highlighted the need for both emotional and practical support to manage contraceptive care. This section (4.2) describes an initial set of design concepts that explore opportunities for emotional and practical support across the patient journey.

4.2.1 Emotional Support

Initial concepts for emotional support explore opportunities to build individual confidence and cultivate supportive relationships at home and within the clinic community. Concepts include Peer Referrals, Peer Stories, and Talk Tools.

Peer Referrals

Tools to help current patients easily refer others to the Teen Services Clinic for contraception or sexual and reproductive health care.

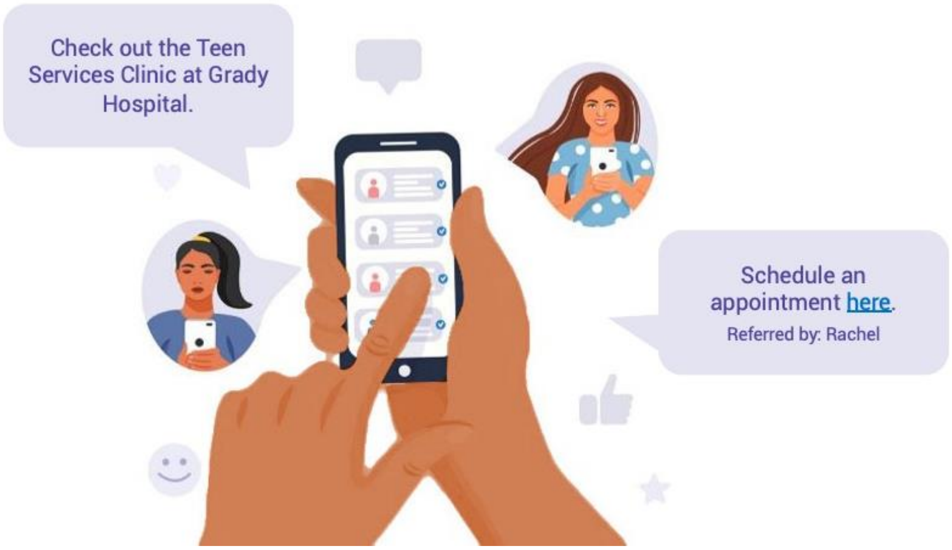


Figure 1. Peer Referrals

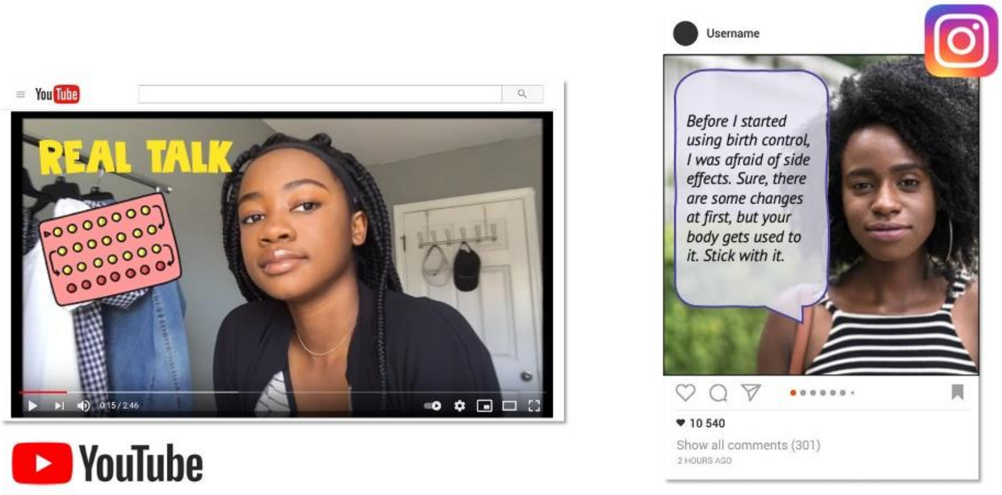
Feedback: Young women reported that they would use this tool to refer friends who are interested in contraception or who may benefit from a "check-up". Young women described that while referring others for care is "the right thing to do", it can result in an uncomfortable conversation: "When people hear 'clinic' they can get real defensive about it" (YW-01, age 18). They felt that a digital referral system could provide enough of a buffer to comfortably connect friends and partners to care. This concept was also supported by clinic staff, who felt strongly that a formal referral system could help increase patient volume and improve awareness of the clinic. Staff also described how formal referrals may improve the public's perception of the Grady Health System and the Teen Services Clinic. Finally, both young women and clinic staff felt that this tool could facilitate successful referrals for male partners, who are especially difficult to approach about sexual health care.

Considerations for further development include:

- *Personalized referrals:* Include the sender's name in referral messages, as anonymous messages were described as "creepy" and easy to ignore
- *Additional information:* Connect referral recipients to information about the Teen Services Clinic and health services (e.g., hyperlinks); young women preferred the option to step back and let recipients do their own research
- *MyChart integration:* Link referrals to the MyChart patient portal system to facilitate new patient enrollment; integration could also help clinic staff identify "clinic champions" based on referral activity
- *Scheduling support:* Connect referral recipients to appointment scheduling via MyChart or phone service number

Peer Stories

Information and advice about experiences with the Teen Services Clinic and contraception, as told by other youth.



Before I started using birth control, I was afraid of side effects. Sure, there are some changes at first, but your body gets used to it. Stick with it.

Figure 2. Peer Stories

Feedback: This concept was prioritized by both young women and clinic staff. Young women felt that Peer Stories could reflect the diversity of experiences that young women have with contraception and help them to feel less alone in their journey. Young women also described the value of learning about contraception from people they can relate to. Peer Stories would be a welcome addition to primarily adult-driven sexual and reproductive health education. Clinic staff felt that Peer Stories may help open up conversation and spark questions that young women could ask during clinic visits. Peer Stories also presented an opportunity to reinforce information shared during clinic visits, specifically, nurse follow-up information.

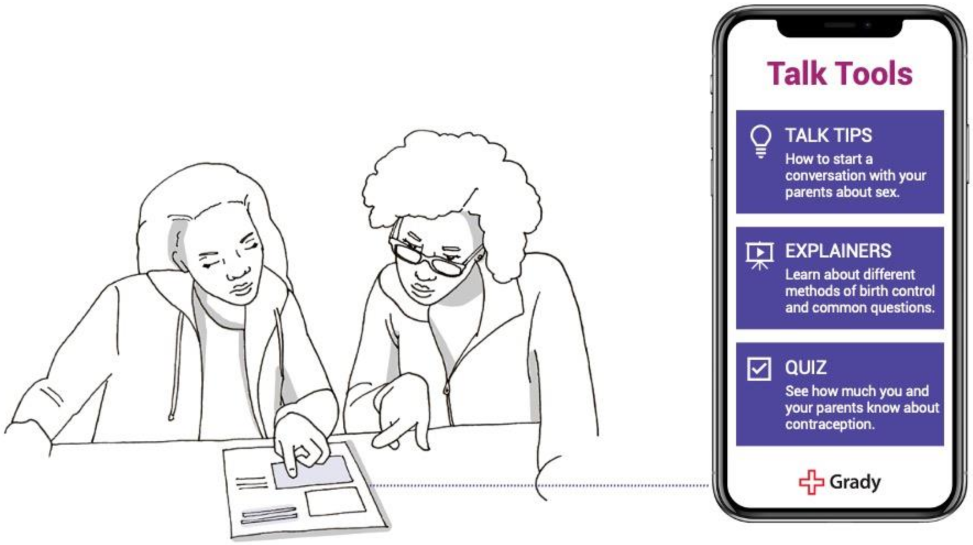
Considerations for further development include:

- *Method explanations:* Describe different methods of contraception and provide tips and tricks for managing user-dependent methods

- *User engagement:* Allow young women to engage with Peer Stories content (i.e. ask questions and receive responses)
- *Positive stories:* Highlight success stories and positive experiences with contraception; young women are already overwhelmed with negative stories and warnings about severe side effects
- *Patient stories:* Incorporate real patient stories and experiences with the Teen Services Clinic and contraceptive use
- *Content management:* Address practical considerations for implementation, including who would create content and manage accounts

Talk Tools

Conversation starters to help young women talk about birth control decisions with parents and partners.



Talk Tools

TALK TIPS
How to start a conversation with your parents about sex.

EXPLAINERS
Learn about different methods of birth control and common questions.

QUIZ
See how much you and your parents know about contraception.

Figure 3. Talk Tools

Feedback: There was mixed support for this concept. Young women reported that they did not necessarily want to discuss sex and contraception with their parents. Clinic staff had a similar reaction. As one health educator described, “Teens may not even want to have that conversation. As long as mom knows, ‘I am having sex, and being responsible by using birth control,’ that’s all she needs to know.” On the other hand, both young women and clinic staff felt that certain Talk Tools features would be useful for other purposes. Young women described a desire to share information (e.g., explanatory videos) with parents or relatives. They also highlighted the quiz feature as a fun way to test their knowledge. Similarly, clinic staff felt that videos and quizzes could help young women build the confidence and skills to talk to their parents in their own way. And, importantly, both young women and clinic staff felt that Talk Tools would help facilitate conversations with partners, especially about STDs.

4.2.2 Practical Support

Initial concepts for practical support explore opportunities to enhance interactions with providers and extend sexual and reproductive health services beyond the clinic setting. Concepts include Self-care Services, Appointment Prep, Service Tracker, and Help Button.

Self-care Services

Clinic-supported options for managing birth control and other sexual health needs at home (e.g., tips and tricks, prescription home delivery, home test kits)

Figure 4. Self-care Services

Feedback: Young women valued the convenience and privacy of home refill delivery and home test kits. They also felt that home delivery may improve adherence to user-dependent methods, like oral contraceptive pills, which currently must be refilled at the Teen Service Clinic. Clinic staff expressed concerns about the technical and financial feasibility of home-based services, as deliveries would require additional oversight and funding from the Grady Health System. They also had reservations about reducing in-person services, as this would limit the clinic's ability to provide holistic patient care and address issues that arise during clinic visits. On the other hand, clinic staff also felt that patients should have more control over their care: "What we do in the clinic matters, but I don't want to overinflate our importance… We are filling some gaps in needs, but it doesn't always have to be us" (Provider, Teen Services Clinic).

Considerations for further development include:

- *Confidentiality:* Protect patient confidentiality for home delivery of prescription refills and test kits, as other members of a household may manage or receive deliveries
- *Eligibility:* Assess patient eligibility for Self-care Services before enrollment, especially from home test kits; in some cases, STD screening may be unnecessary, or there may be a more serious issue that requires clinical care

- *Clinic contact:* Provide remote support to patients utilizing Self-care Services and maintain a connection with the Teen Services Clinic

Appointment Goals

A menu of topics that young women can use to preview clinic offerings and indicate what they hope to cover during a visit.

Figure 5. Appointment Goals

Feedback: Young women perceived Appointment Prep to be a faster and more secure option compared to paper intake forms. Young women also said that they would feel more comfortable indicating topics of concern in private, before arriving for an appointment. Clinic staff agreed that this tool may be helpful for patients, but felt it offered less value to providers. Staff reported that most topics are addressed in some way throughout a clinic visit as part of the holistic patient care model. However, they felt Appointment Prep could better prepare patients for contraceptive care by providing information about methods in advance. As one nurse-midwife described, "They [patients] should already know what the options are by the time they get to me." Young women also described this concept as an opportunity for education (e.g., click for more info, FAQs, short videos).

Considerations for further development include:

- *Additional topics:* Work with young women and clinic staff to determine priority topics; additional topics for consideration include relationships, PrEP (pre-exposure prophylaxis), and gender and gender identity
- *Personal entry:* Include an option for patients to enter other topics or details about what they hope to address
- *Patient education:* Explore alternative interaction models that incorporate options to learn more about each topic (e.g., brief text descriptions, explanatory videos, FAQs)

Service Tracker

A simple tool to document care received during a clinic visit, summarize next steps, and provide a direct link to relevant information.

Figure 6. Service Tracker

Feedback: Young women and clinic staff felt that Service Tracker should be integrated into the MyChart app, which is used to track medical records and test results. In fact, some interpreted this concept as a MyChart upgrade. Young women described the "Next Steps" feature as being particularly useful, as providers' instructions are often forgotten. Likewise, clinic staff described using "Next Steps" to reinforce important directions (e.g., take pills with food). They expressed some concern that Service Tracker may create additional work for providers but were quick to offer potential solutions for streamlining documentation. Ultimately, clinic staff were enthusiastic about the utility offered by this concept: "We could do a better job of being more complete. And this would help" (Provider, Teen Services Clinic).

Considerations for further development include:

- *MyChart integration:* Determine technical capacity to modify or customize the MyChart app to include Service Tracker features, such as "Next Steps"
- *Streamlined documentation:* Explore opportunities to integrate Service Tracker features with existing clinical documentation practices and tools, such as importing a list of common next steps
- *Patient engagement:* Incorporate options for patient input, as this could relieve some of the burdens on clinic staff and encourage young women to be more engaged with their care

Help Button

On-demand information and guidance organized according to common questions about contraception and challenging sexual health scenarios.

Worried? Confused? Or just looking for answers? **Get help.**

I had unprotected sex. Now what?

I am bleeding a lot. Is that normal?

I missed a pill. Now what?

Figure 7. Help Button

Feedback: This concept was prioritized by both young women and clinic staff. Young women felt the Help Button addressed a real and present need: “There are a lot of ‘oops’ moments” (YW-10, age 17). They described how this tool could save valuable time in a moment of alarm. Rather than searching for answers on the Internet or trying to reach a health educator by phone, the Help Button could provide answers quickly and accurately. Young women also felt that the Help Button could ease initial anxiety, even if a trip to the clinic was necessary. Clinic staff echoed these views, noting that this tool could help patients manage issues more effectively. Participants also suggested other issues to address, including vaginal discharge, STDs, and pregnancy.

Considerations for further development include:

- *Patient input:* Identify and prioritize scenarios based on real patient experiences; work with young women to develop an initial list
- *Identifying emergencies:* Determine how to identify and address medical emergencies that require urgent clinical attention

5. Discussion

This thesis project uses traditional qualitative research and data analysis methods in combination with human-centered design to identify opportunities for self-managed contraceptive care for the Grady Health System Teen Services Clinic. Findings from qualitative research with young women and clinic staff were incorporated into a journey map of the contraceptive care experience. The journey map describes the current experience ("as is") according to challenges and supporting themes and proposes possible solutions ("to be") as design opportunities. This approach revealed a wide range of opportunities for self-managed contraceptive care, which were explored through a set of initial design concepts.

Opportunities emerging from qualitative research highlight the need for emotional and practical support across the contraceptive care journey. Design concepts for emotional support (Peer Referrals, Peer Stories, and Talk Tools) explore opportunities to build individual confidence and cultivate supportive relationships at home and among the Teen Services Clinic community. Concepts for practical support (Self-care Services, Appointment Goals, Service Tracker, and Help Button) explore opportunities to promote learning and clarify individual responsibilities during clinic visits, as well as extending sexual and reproductive health services and education beyond the clinic setting.

Two concepts were prioritized by both young women and clinic staff: Peer Stories and Help Button. Peer Stories offers young women reliable information about contraception and reproductive health that reflects their voice and values. Learning from peers also builds solidarity and mutual support, so young women feel less alone. Research has shown the power of peer networks in contraceptive decision-making and calls for options to improve the accuracy of shared information (Mellanby, Newcombe, Rees, & Tripp, 2001; Yee & Simon, 2010). Help Button addresses a real and present need: the many “oops moments” that inevitably occur during teen sexual encounters. Finding answers to urgent questions (e.g., “Does vaginal discharge mean I have an STD?”) quickly and accurately is beneficial to young women and clinic staff. It can ease initial anxiety and triage health incidents, elevating issues that require clinical attention and averting unnecessary clinic visits. Similar services have demonstrated a substantial demand for answers related to contraceptive failure, STD symptoms, unplanned pregnancy, and contraception (Levine, McCright, Dobkin, Woodruff, & Klausner, 2008; Willoughby & Jackson, 2013).

For other concepts, participants highlighted certain components that could be valuable in other applications, particularly explanatory videos and quizzes. Peer Referrals and Talk Tools enable young women to comfortably share information about the Teen Services Clinic and contraception with friends, relatives, and most importantly, male partners. Such digital tools provide a critical buffer for exchanges about sexual and reproductive health care. Young women do not necessarily want to talk to parents about sex and contraception; simply sharing information is enough. They do, however, want ways to communicate with male partners, particularly when it comes to STD prevention and testing. This communication gap is well documented in past work (Crosby et al., 2002; Widman, Choukas-Bradley, Helms, Golin, & Prinstein, 2014; Widman, Noar, Choukas-Bradley, & Francis, 2014). Appointment Goals is more valuable for its potential as an information hub, particularly for learning about different methods of contraception, than as a tool to prepare for upcoming clinic visits. This further supports the need for a reliable go-to source of information on sexual and reproductive health issues, tailored to young women's needs and experiences.

Feedback across all concepts highlighted several other important considerations for self-care solutions: communication, record management, and eligibility. Tools for improving patient-provider communication are valuable to both young women and clinic staff, specifically, documenting instructions for treatment and follow-up care in clear, simple language. Such tools, including features of the Service Tracker concept, should be integrated with the existing electronic health records system to supplement patient records and streamline clinic processes. While the Teen Services Clinic specializes in adolescent sexual and reproductive health care, communication can still be challenging, especially for patients. Research shows that teens experience persistent challenges to sexuality communication with physicians (Alexander et al., 2014; Fuzzell, Fedesco, Alexander, Fortenberry, & Shields, 2016). It is also important to consider that not all self-care services are appropriate for everyone, and some young women may prefer direct provider interaction for most of their contraceptive care needs. Further, clinic staff may determine that patients with advanced needs (e.g., mental health care) should maintain regular clinical care. As such, some self-care services may require specific eligibility criteria.

These findings demonstrate the need to further develop design concepts, including content and engagement models for digital tools, and explore integration with existing Grady health record systems.

6. Recommendations and Next Steps

Due to the scope of this thesis project, human-centered design methods were limited to inspiration and some ideation. Recommended next steps for implementation are summarized here, along with additional ideation activities. These recommendations are based on human-centered design best practices and the priorities and constraints of the Teen Services Clinic.

6.1 Additional Ideation Activities

Most of the design concepts are digital tools or services. Additional ideation activities should explore content and engagement models through co-creation and prototyping with young women and clinic staff. These activities should also explore options to integrate concepts into one service or platform. Specific activities include:

- Explore how Instagram can be used to organize Peer Stories content and increase user engagement; create sample stories to hone language/tone and visual style
- Explore options to integrate Peer Referrals with Peer Stories, such as sending "referral" posts to personal Instagram contacts, rather than developing two distinct services
- Explore content and use cases for explanatory videos and quizzes

For practical support concepts (Self-care Services, Appointment Prep, Service Tracker, and Help Button), identify opportunities to integrate with the MyChart patient portal app. Alternatively, combine these concepts into a new app that complements MyChart services.

6.2 Implementation

Outcomes from additional ideation activities should be used to build more complete prototypes of consolidated concepts. These may include a fully functional Instagram account that demonstrates key features and content, static or interactive wireframes of a mobile app, and high fidelity examples of visual design (i.e. image and graphic style, color scheme, and font selection). Then, follow-up interviews should be conducted with young women and clinic staff to assess prototypes and collaborate on improvements.

As concepts are refined and tested, it will also be important to collaborate with key stakeholders and implementation partners. Specific activities include:

- Identify key stakeholders from Grady Health System and any protocols, requirements, or restrictions regarding new patient services/communications
- Identify key partners and personnel for product development, implementation, and maintenance (e.g., technology partner, clinic staff)

Finally, content and engagement models should be further refined and tested, and the user experience and visual design should be built out in full fidelity in collaboration with development partners.

7. Reflections on Methods

This thesis utilized methods from traditional social-behavioral research and human-centered design. While these approaches generally have different objectives and processes, they are both intrinsically human-centered and utilize similar qualitative research methods and models. In the context of public health, social-behavioral research is often used to generate theories about human attitudes and behaviors that can inform interventions and contribute to scientific knowledge. Human-centered design, however, is used to generate ideas that are tested and refined to arrive at new solutions.

Both approaches utilize similar qualitative research methods, such as interviews, focus group discussions, and observation. Social-behavioral research is more protocol-driven, whereas HCD tends to be more fluid, with designers free to follow hunches and change questions mid-stream. This thesis utilized a structured protocol, in line with traditional social-behavioral research, however, hunches were not ignored. Ideas that arose throughout interviews and data analysis were noted for exploration in collaborative design sessions.

Human-centered design and social-behavioral research also utilize similar models for data collection and analysis. This thesis used a journey map to describe challenges and identify opportunities across the contraceptive experience. The journey map model has parallels with the Transtheoretical Model used in social-behavioral research. Both models are composed of similar, progressive stages that reflect the complexity of human behavior, and each can be used to identify opportunities for intervention. Human-centered design also organizes data to some extent around socio-ecological models, which are often referred to as ecosystem maps or influencer maps. One key difference is that social-behavioral research tends to be more explicit in the use of theoretical models to structure research and analyze data. While similar models are used in human-centered design, they tend to be supporting tools for data collection and analysis rather than the driving theory.

Each approach has its strengths and shortcomings. For this thesis, systematic data collection and analysis resulted in a deep, well-rounded understanding of contraceptive care. However, this process was time-consuming and may not have added substantial value to the objective of getting to ideas for self-managed contraceptive care. Human-centered design methods, including the journey map and concept visualizations, were effective for identifying and exploring a wide range of opportunities for self-care beyond obvious solutions. However, the absence of an explicit theoretical model may diminish the value of the results and create a challenge for future evaluation. This is a common criticism of HCD-driven interventions.

In my experience, both social-behavioral research and human-centered design are valuable to developing novel solutions. Drawing on the strengths of each approach can enhance research methods overall and contribute to effective health interventions. Key considerations for a hybrid approach include:

- Initial research should be structured with some uniformity in how data are collected and analyzed
- At the same time, it is important to leave room for experimentation; this could be a distinct component built into the initial research protocol or included as a follow-up activity

- Integrate participatory data collection methods and prototyping into the research and development process; aim to test ideas or recommendations that would otherwise be presented as study conclusions
- For HCD-driven interventions, retrospectively apply a theoretical framework (e.g., Transtheoretical Model) to facilitate program/product evaluation

Complex health challenges require a multidisciplinary set of approaches and expertise. When employed in conjunction with traditional public health approaches, human-centered design can be a powerful tool for health care innovation.

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Appendix

Discussion Guide: Young Women

Duration: ~60 min

Topics & Activities

1. Background (5 min)
2. Teen Clinic (10 min)
3. Experiences with Contraception (15 min)
4. Contraceptive Self-management Options (15 min)

Opening (5 min)

Introduction:

Thank you for taking the time to meet with me. My name is Rachel; I am a graduate student studying public health at Emory University.

This interview is part of my school thesis project. I am working with Dr. Kottke and the Teen Clinic to develop a concept for "self-managed" contraceptive care. Think of this as a tool that would extend Teen Clinic services beyond Grady and provide support to you and other patients at home and in your day-to-day lives. This could be a mobile app, a website, or a combination of tools and resources that build on some of the things the Teen Clinic already provides.

The most important part of this project is speaking directly with young women, like yourself, who may benefit from a tool like this. Because, when it comes to your needs, you are the expert. I am here to learn from you. There are no right or wrong answers. I would just like to hear about your experiences and perspectives related to the Teen Clinic and contraceptive use. Your opinions will be anonymous, so please share freely!

Before we go any further, I will review some additional details about this project and the nature of your participation and answer any questions you may have. Then, you can decide whether or not to take part.

Consent: *Review the Participant Information Sheet and invite the participant to ask any questions. Ask consent questions and document oral consent on consent form. Add participant ID number to consent form.*

- Do you have any questions about the project or this interview?

- Do you consent to participate in this interview?
- Do you consent to be recorded?

Start recording

Background (5 min)

To start, I would like to learn a little bit about you. First, I have a few quick background questions. Let's go through these together. Then, we can move ahead with our conversation.

Go through demographics form.

Thank you! Now, let's move ahead with our conversation.

- Please tell me how you would describe yourself, as a person. What do you like most about yourself?
- Please tell me about your hopes or goals for the future.
    - Why are these things important to you?
    - What would help you to achieve these goals?

Teen Clinic (10 min)

Thank you for sharing that. It is very nice to meet you. Now, I would like to talk about the Teen Clinic.

- *Describing the Teen Clinic:* First, think about the Teen Clinic—the staff, the services, the kind of care and support you receive… On this piece of paper, please write down a few words or feelings that come to mind when you think about the Teen Clinic.
    - *Probe on a few words.* Please tell me about why you wrote this word. Is there a story behind this word?
    - What do you like most about the Teen Clinic?
    - Do you remember how you felt the first time you came in?
- *Patient experience:* Now, I would like to learn more about specific experiences you have had at the Teen Clinic.
    - Are you comfortable speaking with the doctors and health educators about sex and sexual health?
        - Are any topics off limits? Please tell me about these.
        - If you are uncomfortable addressing certain topics at the Teen Clinic, where can you get the information or advice that you need?
    - Think about a really good experience at the Teen Clinic. Please describe this experience.

        - What happened?
        - What made it a good experience?
    - Now, think about an experience at the Teen Clinic that was not so good. Please describe this experience.
        - What happened?
        - What made it a bad experience?
        - Looking back, what could have improved that experience?
    - Would you recommend the Teen Clinic to others? Please describe why or why not.
        - What advice would you give to the staff at the Teen Clinic about how they could better support patients?

Experiences with Contraception (15 min)

Thank you, I appreciate you sharing that with me. Now, I would like to talk about birth control, which is also referred to as contraception.

- *Significance:* Please tell me why birth control is important to you.
- *Current method:* Earlier, you mentioned that you were using [method] for birth control. Think back to when you first started this method. Please walk me through your experience with [method], beginning from when you first started it, to managing ongoing use, and what it is like now.
    - How did you decide on this method?
    - Have you had any questions or issues related to this method? Please describe.
        - How did/would you address these?
    - Would you recommend this method to a friend? Please describe why or why not.
    - What role do your parents play in your use of birth control?
        - Would you like them to be more or less involved? Why?
    - What about a partner, like a boyfriend or a girlfriend—what role do they play?
        - Would you like them to be more or less involved? Why?

- [Time allowing] *Other SRH concerns:* Here are some other topics related to sexual health that you may occasionally have questions about. *Show cards with SRH topics.* Please select the topics that are most important to you.
    - Of these topics, which one or two are at the top of your mind?
    - *Probe on the prioritized topics:* Please describe why these topics are important to you.

  - If you have questions or concerns about any of these topics, where do you go for answers?

Contraceptive Self-management Options (15 min)

Thank you very much. Finally, I would like to discuss some new options for managing methods of birth control. I have some pictures and videos to help us with this conversation.

- *Existing services:* Here are a few examples of some new options for managing birth control. Each of these options is meant to give you, the user more control over your own care. *Show examples and describe, one at a time.* Please describe your initial reaction to these services.
  - Are any of these familiar to you?
  - What questions or concerns do you have?
  - Would you use any of these options? Please describe why or why not.

Closing (5 min)

Thank you very much for speaking with me and sharing your thoughts and experiences. I would like to wrap up with a couple of final questions.

- Thinking about our conversation and those new options we just looked at, what might self-managed contraceptive care look like to you?
- Is there anything else you would like to share that we have not discussed already?
- Do you have any questions for me?

Okay, that concludes our interview! Thank you very much for taking the time to talk with me today.

Stop recording. *Ask about participation in co-design activities.*

Discussion Guide: Clinic Staff

Duration: ~30 min

Objectives

- Define individual role and responsibilities and explore the provider/staff member's unique value to the clinic and patients
- Build on understanding of clinic flow, including details about key activities/steps, staff engagement and interactions, tools and resources, and the locations of activities and interactions
- Explore perspectives on the value of the Teen Clinic and the services it provides to young women, including what works well and areas for improvement
- Explore perspectives on patient needs and challenges regarding birth control and how these are addressed by the Teen Clinic

Topics & Activities

1. Role and Responsibilities
2. Clinic Services
3. Patients and Patient Care

Opening (5 min)

Introduction

Thank you for taking the time to meet with me. My name is Rachel Regina; I am a second-year Master of Public Health student from Emory University.

This interview is part of my thesis project. I am working with Dr. Kottke to develop a concept for "self-managed" contraceptive care that would extend family planning services beyond the Teen Clinic and continue to support patients after they walk out the door. This could be a mobile app, a website, or a combination of tools and resources that build on the EPIC system.

This project incorporates human-centered design, an approach to innovation that engages users and stakeholders throughout the design and development process. I will spend time speaking with other providers and clinic staff members, like yourself, and young women who receive sexual and reproductive health care from the Teen Clinic. These conversations will inform and inspire initial ideas for "self-managed" contraceptive care options, which will then be shaped and refined through a series of collaborative design activities.

Before we go any further, I will review additional details about this project and the nature of your participation and answer any questions you may have. Then, you can decide whether or not to take part.

Consent: *Review the Participant Information Sheet and invite the participant to ask any questions. Ask consent questions and document oral consent on consent form. Add participant ID number to consent form.*

- Do you have any questions about the project or this interview?
- Do you consent to participate in this interview?
- Do you consent to be recorded?

Start recording

Role & Responsibilities (5 min)

- *Position*: To start, please tell me about your role at the Teen Clinic.
    - How long have you been working there?
    - What do you like best about your work?
    - What keeps you going?
- *Day in the Life:* Please describe what a typical day at the clinic is like for you.
    - Who else do you work with?
    - What kinds of tools or resources do you most often use to support your work?

Clinic Services (10 min)

Thank you for sharing that. Now, I would like to discuss the clinic.

- *Service goals:* In your opinion, what is the primary goal or mission of the Teen Clinic?
    - What outcomes do you hope to achieve?
    - How do you hope to affect the lives of your patients?
- *Clinic value:* In your opinion, what is special or unique about the Teen Clinic here at Grady Hospital?
    - What does the clinic do really well?
    - What could it improve upon?

Patients & Patient Care (15 min)

Thank you. Next, I would like to learn about your patients and how you interact with them.

- *Population*: Please describe the population of young women you serve at the Teen Clinic.
    - What are their reproductive health needs?

    - What questions or concerns do they commonly have?
    - Why do they come to the Grady Teen Clinic for care (and not somewhere else)?
    - What about your patients—their needs, questions, motivations—has most surprised you?
- *Engaging with patients*: Please describe your interactions with these young women.
    - What techniques or tools have been helpful in facilitating discussions about sexual and reproductive health?
    - Think about an interaction you had with a patient that went really well. Please describe this interaction.
        - What was the interaction about?
        - What made this a good interaction?
    - Now, think about an interaction you had with a patient that did NOT go well. Please describe this interaction.
        - What was the interaction about?
        - Why do you think it did not go well?
        - Looking back, what might have improved the interaction?
    - How has the COVID-19 pandemic affected your interactions with patients?
        - What has been challenging?
        - What has been an improvement or unexpected benefit?
        - How has telehealth played a role?
    - Finally, describe how the Teen Clinic could better support patients, both in the clinic and beyond.

Closing (5 min)

Thank you very much for speaking with me and sharing your thoughts and experiences. I would like to wrap up with a couple of final questions.

- Please describe your vision for “self-managed” contraception.
- Is there anything else you would like to share that we have not discussed already?
- Do you have any questions for me?

Okay, that concludes our interview! Thank you very much for taking the time to talk with me today.

Stop recording.