



Knowledge and Use of Mobile Health Applications in Family Planning among Married Undergraduate Women at Chukwuemeka Odumegwu Ojukwu University (COOU), Igbariam, Anambra State

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Abstract

This study examined the knowledge, use, types and satisfaction associated with mHealth applications for family planning among married female undergraduates at Chukwuemeka Odumegwu Ojukwu University (COOU). Guided by the Diffusion of Innovations Theory, the study employed a quantitative survey design. Using purposive and snowball sampling, data were collected from 121 married female undergraduates through an online questionnaire. Data were analysed using frequency counts and percentages. The findings showed a moderate level of knowledge of mHealth applications for family planning, with an average correct-response rate of 55.8% across the six knowledge items. Knowledge was highest regarding the provision of sexual and reproductive health education (62.0%) and menstrual-cycle tracking and fertile-day prediction (60.3%), but lowest regarding connection to nearby health services (48.8%). Regarding extent of use, 49.6% reported using mHealth applications sometimes, 28.9% often, 5.0% always, while 16.6% used them rarely or not at all. Flo Period & Ovulation Tracker was the most frequently reported application (45.5%), followed by Clue (16.5%) and Ovia Fertility (12.4%). Satisfaction was generally favourable regarding information accuracy (70.2%), ease of navigation (67.8%), reminders and alerts (66.1%), and perceived control over family-planning decisions (68.6%), while 66.9% reported overall satisfaction. However, satisfaction with personal and health-data security was substantially lower, with only 24.8% satisfied or very satisfied and 50.4% dissatisfied or very dissatisfied. The study concludes that mHealth applications have gained some level of awareness and use among married female undergraduates at COOU, but gaps in knowledge and concerns about data security may constrain sustained engagement. The study recommends improved user education, culturally and contextually relevant family-planning content, and stronger privacy and data-security safeguards in mHealth applications.

Keywords: COOU, family planning, knowledge, married women, mHealth, undergraduates

Introduction

In recent decades, the rapid growth of technology has significantly transformed all sectors of society, including the healthcare sector. Digital innovations now play a central role in how individuals access, manage, and interact with healthcare services (World Health Organization, 2024; Adikuru, et al., 2025). One of the most remarkable outcomes of this technological revolution is the emergence of mobile health (mHealth) applications software programmes designed for use on smartphones and tablets to support a variety of health-related functions. mHealth apps have been deployed across diverse fields of healthcare including chronic disease management, maternal and child health, mental health, fitness monitoring,



medication adherence, and more recently, reproductive health and family planning (Wells & Spry, 2022). These digital tools offer users convenience, privacy, personalised health information, and easy access to services, making them particularly valuable in contexts where traditional health service delivery may be limited or stigmatized (Obiora & Uche, 2024).

In the area of family planning, mHealth applications are increasingly being developed to provide accurate information on contraceptive methods, fertility tracking, appointment reminders, and direct communication with healthcare providers (Chandrasekar et al, 2024). For married undergraduate women who are pursuing education and managing marital and reproductive responsibilities simultaneously, family planning becomes not only a health issue but also an academic and socio-economic imperative. Balancing education and childbearing is often a challenge, and the ability to plan and space pregnancies can significantly enhance academic performance, economic stability, and overall well-being. The adoption of mHealth apps for family planning could thus provide vital support for married undergraduate women, offering discreet, reliable, and user-friendly access to contraceptive information and services. However, the successful utilisation of these applications largely depends on the users' awareness and understanding of their existence and functionality. In other words, knowledge is a key determinant in the adoption of health innovations. Prior studies (e.g., Rogers, 2003; Davis, 1989) have consistently demonstrated that knowledge gaps significantly undermine the acceptance and integration of new technologies, particularly in developing regions.

Despite the proliferation of mHealth apps focused on reproductive health and contraception, there appears to be a paucity of research investigating the level of knowledge and actual use of these applications among specific populations especially among married women in higher institutions of learning. At Chukwuemeka Odumegwu Ojukwu University (COOU), where a number of female students are also married and navigating both educational and familial responsibilities, it is important to understand how well these women are informed about and engage with mHealth apps for family planning.

Statement of the Problem

The integration of mobile health (mHealth) applications into healthcare delivery has introduced innovative ways of accessing family planning information and services. These applications hold immense potential in promoting reproductive health, particularly among women who require flexibility, privacy, and convenience such as married undergraduate students balancing academic and familial responsibilities. Despite the increasing availability and benefits of mHealth apps for family planning, their effectiveness is ultimately dependent on users' knowledge and willingness to adopt them.

In Nigeria, and particularly in educational institutions such as Chukwuemeka Odumegwu Ojukwu University (COOU), there exists a growing population of married female students whose reproductive choices significantly impact their academic success and overall well-being. However, the extent to which these women are aware of and utilise mHealth apps for family planning remains unclear. While prior research has emphasised the importance of technological innovation in healthcare, studies also show that a lack of knowledge can hinder the adoption of such innovations.

Although many mHealth applications for contraception and fertility tracking are increasingly available, there is a noticeable paucity of empirical studies focused on their knowledge and use among married undergraduate women in Nigerian universities and COOU



in particular. Therefore, this study seeks to address this gap.

Objectives of the Study

1. To determine the level of knowledge of mHealth applications for family planning among married undergraduate women in COOU.
2. To ascertain the extent married undergraduate women in COOU used mHealth applications for family planning purposes.
3. To identify the types of mHealth apps used by the respondents for family planning purposes.
4. To ascertain the level of satisfaction with the usage of mHealth applications in managing family planning needs among the target population.

Conceptual Review

mHealth Mobile App

A mobile application (mobile app) refers to a software application designed specifically for use on mobile devices such as smartphones and tablets (Chandran et al., 2022). Mobile apps serve diverse purposes, including social networking, entertainment, productivity, and business activities (Hanna & Wigmore, 2023). Their portability and accessibility create opportunities for users to obtain information and services across different contexts and locations (Timmers et al., 2020). In healthcare, smartphone and tablet applications are increasingly used for patient education, clinical practice, disease management, and access to health information (Boulos et al., 2014; Chandran et al., 2022).

Mobile health (mHealth) applications represent an important component of digital health. The World Health Organization (WHO, 2021) defines mHealth broadly as the use of mobile devices for medical and public health practice. mHealth can provide convenient, portable, and real-time access to health information and services while supporting patient engagement, care coordination, health promotion, and remote care (WHO, 2021). These applications have been developed for a range of functions, including patient education, disease management, symptom monitoring, and communication with healthcare providers (Boulos et al., 2014; Chandran et al., 2022).

Evidence from systematic reviews indicates that smartphone and tablet applications can support the delivery of timely health information and contribute to patient knowledge, treatment adherence, and satisfaction (Timmers et al., 2020). In reproductive health, mHealth applications have increasingly been developed and evaluated for menstrual and fertility tracking, contraception, and fertility awareness (Earle et al., 2021; Kalampalikis et al., 2022). Systematic review evidence indicates that menstrual and fertility applications can facilitate users' awareness of menstruation and fertility and may support contraceptive and fertility-related decision-making, although concerns regarding the accuracy, evidence base, and privacy of some applications remain (Earle et al., 2021; Kalampalikis et al., 2022).

Family Planning

Family planning refers to the ability of individuals and couples to determine whether and when to have children and to plan the timing and spacing of pregnancies in accordance with their reproductive goals (OlaOlorun et al., 2020). Contraceptive use constitutes an important means through which these reproductive goals can be pursued, particularly by enabling women and couples to prevent or delay pregnancies when they do not wish to conceive (OlaOlorun et al., 2020). Family planning is therefore closely connected with



reproductive autonomy because decisions about contraceptive use involve women's and couples' ability to participate in decisions concerning their sexual and reproductive lives. Evidence from Nigeria indicates that sexual autonomy and participation in household and healthcare decision-making are positively associated with modern contraceptive use (Okigbo & Speizer, 2017; Olorunsaiye et al., 2017).

Family planning encompasses a range of contraceptive options, including barrier methods such as condoms, hormonal methods such as oral contraceptive pills and injectables, long-acting reversible methods such as implants and intrauterine devices, fertility-awareness methods, and permanent methods such as sterilisation (World Health Organization [WHO], 2023). Family-planning services also involve access to appropriate information, counselling, and reproductive-health services that enable individuals to make informed choices about contraception and fertility. The availability and utilisation of such services, however, are shaped by socioeconomic, demographic, interpersonal, and community-level factors. Evidence from Nigeria shows that education, wealth, place of residence, and women's decision-making autonomy are associated with differences in modern contraceptive use (Asaolu et al., 2017; Olorunsaiye et al., 2017).

The importance of family planning extends beyond the prevention of unintended pregnancy to broader reproductive-health and social outcomes. By enabling women and couples to plan the timing and spacing of pregnancies, contraceptive use can help reduce exposure to unintended pregnancies and their associated health and social consequences. The relationship between family planning and women's empowerment is also increasingly examined in empirical research. Nigerian studies have reported associations between women's autonomy and contraceptive use, suggesting that the ability to participate in decisions concerning healthcare, household matters, and sexual relationships is relevant to contraceptive behaviour (Okigbo & Speizer, 2017.; Olorunsaiye et al., 2017). However, evidence concerning whether family-planning use itself produces improvements in specific empowerment outcomes, such as education, employment, wages, and household decision-making, remains less conclusive (Diamond-Smith et al., 2025). Thus, family planning is better understood as one component of a broader set of social, economic, and health conditions that shape women's reproductive autonomy and life opportunities.

For married female undergraduates, these considerations are particularly relevant because reproductive decisions may intersect with educational responsibilities and family commitments. Access to appropriate family-planning information and services may enable women to make reproductive decisions that are consistent with their desired timing of pregnancy and broader life plans. Nevertheless, the extent to which family planning facilitates educational continuity depends on factors beyond contraceptive access, including women's autonomy, partner support, socioeconomic circumstances, cultural expectations, and the availability of acceptable reproductive-health services.

Review of Empirical Studies

The growing use of mobile health (mHealth) technologies has led to a number of empirical studies. Evidence from intervention studies provides some support for the educational value of mHealth. Vanestanagh et al. (2021), for example, found that smartphone-based reproductive health education significantly improved overall knowledge and self-care practices among married female students in Iran. The absence of a significant improvement in



family planning knowledge, however, complicates the assumption that gains in general reproductive health knowledge necessarily extend to contraceptive or family planning decision-making. The finding suggests that the effectiveness of mHealth may depend not simply on whether reproductive health information is delivered digitally, but on the specificity, relevance and cultural appropriateness of the content. Thus, mHealth should not be treated as a uniform intervention whose effects are transferable across all areas of reproductive health.

Other studies provide stronger evidence that well-designed mobile interventions can influence reproductive health practices. In Uganda, Nuwamanya et al. (2020) reported significant improvements among university students who used a mobile application in relation to sexual and reproductive health knowledge, contraceptive use, HIV counselling and testing, sexually transmitted infection services, and condom use. The study is particularly significant because its university-based population demonstrates that mobile interventions can operate within student populations where mobile technologies are already integrated into everyday communication. Nevertheless, its broad focus on sexual and reproductive health means that it provides limited evidence about how students use applications specifically for family planning, fertility tracking or reproductive decision-making.

The literature on actual user preferences further demonstrates that technological availability alone is insufficient. Abrejo, et al. (2022), in a qualitative exploratory study involving women and family planning service providers, found that although mobile phones were widely used for general and health-related information, relatively few participants had accessed sexual and reproductive health content. Participants nevertheless expressed support for a potential family planning application, particularly one incorporating audio-visual materials, local languages, information on contraceptive methods, side effects and benefits. These findings reveal an important gap between general mobile-phone use and purposeful engagement with digital family planning information. They also suggest that acceptability is shaped by the way information is packaged and communicated rather than by technological access alone.

This issue is reinforced by Chukwu et al. (2021), whose formative research in Sierra Leone showed that many existing family planning interventions depended on SMS, while purpose-built applications were relatively uncommon. The study also identified a technological divide: although young people commonly owned mobile phones, many possessed basic rather than smartphones, thereby restricting their ability to access app-based interventions. Participants' preference for audio-visual formats nevertheless illustrates the tension between what users find useful and what their devices can support. The implication is that mHealth interventions need to be designed around the technological realities of their intended users rather than assuming universal smartphone access. This consideration is particularly pertinent when findings from different populations are applied to university students, whose access to smartphones and internet-enabled services may differ substantially from that of young people in rural or lower-resource settings.

Research among university students in Nigeria provides more direct evidence of the use of reproductive health applications. Nwafor, et al. (2022) examined female students at Chukwuemeka Odumegwu Ojukwu University who used the Flo Period and Ovulation Tracker. Guided by the Technology Acceptance Model, the study found regular use of the application for purposes that included sexual activity planning, menstrual management and monitoring of



ovulation-related concerns. This evidence is important because it moves beyond the question of whether women can access mHealth applications to consider what they actually do with them. At the same time, variation in the purposes for which students use the application indicates that reproductive health applications serve multiple functions, and their use cannot necessarily be equated with deliberate family planning behaviour. The recommendation for greater interactivity, including voice functions and connections with healthcare facilities, further points to the limitations of applications that operate in isolation from formal health services.

The Nigerian evidence also exposes an important difference between awareness, perceived usefulness and actual adoption. Ezeah and Vincent (2025), studying women in a rural community in Enugu State, reported moderate awareness but low utilisation of maternal-health mHealth applications. Although participants generally perceived the applications as useful, easy to use and trustworthy, poor internet connectivity, high data costs, limited technical skills and inadequate healthcare-provider endorsement constrained adoption. Similarly, Nwosu et al. (2023) found low awareness and utilisation of pregnancy applications among women of reproductive age in Anambra State despite relatively high exposure to mobile technology. Among users, applications were used mainly for monitoring foetal development and receiving pregnancy guidance, while functions associated with ovulation tracking and other reproductive decisions received less attention. These studies indicate that exposure to digital health technologies is not equivalent to adoption, and adoption itself does not necessarily imply use for family planning purposes.

The distinction between access, use and reproductive knowledge is also evident in evidence from Australia. Ford et al. (2020), in an online survey of 673 women, found that reproductive health applications were used by 43.09% of respondents, with menstrual tracking constituting the dominant use. Although users demonstrated better knowledge of fertility during the menstrual cycle than non-users, overall fertility knowledge remained limited. This finding raises an important question concerning the direction and nature of the relationship between application use and knowledge. Application users may acquire greater fertility awareness through repeated engagement with digital tools, but the available evidence does not establish that application use alone produces comprehensive fertility knowledge. The finding therefore supports a more cautious interpretation of mHealth applications as potential sources of reproductive information rather than assuming that their use automatically produces informed family planning decisions.

The role of healthcare providers constitutes another relatively underdeveloped dimension of the literature. Logie et al. (2020), in a global web-based survey, found that only about one-third of participating healthcare providers had referred clients to sexual and reproductive health applications. Although some providers reported confidence in their knowledge of such applications, a substantial proportion indicated a need for additional information and training. Concerns about security and confidentiality, together with the need for community engagement, were also identified. These findings broaden the discussion beyond the individual user by demonstrating that the usefulness of mHealth applications can also depend on the extent to which health professionals recognise, recommend and integrate them into reproductive health communication and service delivery. An application may therefore be technically accessible and personally acceptable while remaining marginal to formal family planning practice.



The literature points to three related but distinct issues. First, mHealth interventions can improve reproductive health knowledge and, in some circumstances, encourage healthier practices. Second, the extent to which these benefits occur depends on content relevance, usability, technological access, cultural appropriateness and user engagement. Third, there remains a substantial difference between awareness of mHealth technologies and their purposeful use for family planning. The evidence is therefore less conclusive when the focus shifts from general reproductive health education to specific fertility awareness, contraceptive decision-making and family planning behaviour.

A limitation of the existing literature is its fragmentation across different populations, reproductive-health concerns and technological environments. Studies have examined married women, university students, rural women, women of reproductive age, young people and healthcare providers, while interventions have addressed general reproductive health, maternal health, pregnancy, fertility knowledge, menstrual tracking and family planning. This diversity provides useful contextual evidence but makes it difficult to determine how married undergraduate women use mHealth applications specifically for family planning. The evidence from Chukwu et al. (2021), for instance, highlights device and connectivity constraints among young people, whereas Nwafor et al. (2022) demonstrates application use among female university students in the same broader Nigerian context.

Similarly, Ezeah and Vincent (2025) identify infrastructural and digital-literacy barriers in a rural Nigerian population, but their findings cannot be assumed to represent university students who may have different levels of digital access and literacy. The literature also leaves insufficiently examined the relationship between mHealth application use and actual family planning decision-making among married female undergraduates. Existing studies provide evidence of application use for menstrual tracking, fertility awareness, pregnancy monitoring and broader reproductive health purposes, but comparatively little is known about whether and how these applications inform decisions about contraceptive choice, timing of sexual activity, conception avoidance or fertility planning within marriage. This is a significant gap because family planning involves not only access to information but also interpretation of that information and its incorporation into personal and relational decisions. Against this background, examining mHealth application use among undergraduate married women at Chukwuemeka Odumegwu Ojukwu University is warranted.

Theoretical Framework

The current study is anchored on the Diffusion of Innovations (DOI) Theory, developed by Everett M. Rogers (Rogers, 1962). The theory explains how an innovation is communicated through particular channels over time among members of a social system and provides a framework for understanding differences in the rate and pattern of adoption. García-Avilés (2020) similarly describes DOI as a framework for examining the communication, adoption and diffusion of innovations, including technological innovations. The theory has also been applied in mHealth research, where it provides a basis for examining the social, organisational and technological conditions that shape the adoption of mobile health technologies (Ross et al., 2020; Jacob et al., 2020).

A central proposition of DOI is that adoption develops through an innovation-decision process rather than occurring as an instantaneous act. Rogers (2003) identifies five stages in this process: knowledge, persuasion, decision, implementation and confirmation. Knowledge



occurs when an individual becomes aware of an innovation and gains some understanding of how it functions; persuasion involves the formation of an attitude towards the innovation; decision involves choosing whether to adopt or reject it; implementation occurs when the innovation is put into use; and confirmation involves seeking reinforcement for the decision already made. The theory also distinguishes five adopter categories according to the relative earliness with which individuals adopt an innovation: innovators, early adopters, early majority, late majority and laggards (Rogers, 2003; García-Avilés, 2020).

Another major component of DOI is the perceived characteristics of an innovation. Rogers (2003) identifies five attributes that influence the rate at which an innovation is adopted: relative advantage, compatibility, complexity, trialability and observability. Relative advantage refers to the extent to which an innovation is perceived as better than an existing alternative; compatibility concerns its consistency with users' values, experiences and needs; complexity refers to the perceived difficulty of understanding or using it; trialability concerns the extent to which it can be experimented with before full adoption; and observability refers to the visibility of its results. Innovations perceived as having greater relative advantage, compatibility, trialability and observability, and lower complexity, tend to be adopted more rapidly (Rogers, 2003).

The theory is relevant to the present study of knowledge and use of mHealth applications for family planning among married undergraduate women at Chukwuemeka Odumegwu Ojukwu University (COOU). Its relevance lies particularly in its treatment of knowledge as the initial stage of the innovation-decision process and its emphasis on users' perceptions of an innovation and the social environment in which adoption occurs. In the context of mHealth, adoption cannot be understood solely in terms of whether an application is technically available; research on mHealth adoption indicates that users' perceptions and social, organisational and technological conditions can shape the adoption process (Ross et al., 2020; Jacob et al., 2020). DOI therefore provides a useful framework for examining whether awareness and knowledge of family-planning applications are associated with progression towards their use, while also drawing attention to contextual influences such as communication networks and users' experiences with the technology.

For the present study, particular attention is given to the knowledge stage and the subsequent decision to adopt or use mHealth applications for family-planning information. The framework therefore helps the study examine whether limited knowledge, uncertainty about the usefulness of applications, perceived difficulty of use, compatibility with users' reproductive-health information needs, and the social context in which applications are encountered may shape their adoption.

Research Methodology

This study employed a quantitative survey design. The study population comprised married female undergraduate students at Chukwuemeka Odumegwu Ojukwu University (COOU), from whom 121 respondents were selected. Purposive sampling was used to identify eligible participants based on the inclusion criterion of being married female undergraduates, while snowball sampling facilitated access to additional eligible participants through referrals, given the potentially limited and dispersed nature of the target population. Data were collected through an online questionnaire, which facilitated convenient administration and enabled respondents to participate alongside their academic and personal commitments. Data were



analysed using descriptive statistics, specifically frequency counts and percentages, to summarise respondents' demographic characteristics and responses to the research objectives.

Data Presentation

Table 1. *Demographic Data of Respondents*

Demographic Information	Category	F	%
Level in School	100 Level	35	28.9
	200 Level	30	24.8
	300 Level	23	19.1
	400 Level	28	23.1
	500 Level	5	4.1
Age Group (years)	18–24	6	5.0
	25–30	28	23.1
	31–35	87	71.9
Faculty of Study	Arts & Social Sciences	48	39.7
	Science	32	26.4
	Education	23	19.0
	Management Sciences	18	14.9
Duration of Marriage	1–3 years	61	50.4
	4–6 Years	46	38.0
	7–9 years	14	11.6
	10+ years	0	0.0

Note. $N = 121$.

The demographic data for the 121 respondents show that the largest proportion were in 100 level (28.9%), followed by 200 level (24.8%), 400 level (23.1%), 300 level (19.1%), and 500 level (4.1%). Age-wise, most respondents were aged 31–35 years (71.9%), followed by those aged 25–30 years (23.1%), while only 5.0% were aged 18–24 years. In terms of faculty, respondents were predominantly from Arts and Social Sciences (39.7%), followed by Sciences (26.4%), Education (19.0%), and Management Sciences (14.9%). Regarding duration of marriage, half of the respondents had been married for 1–3 years (50.4%), while 38.0% had been married for 4–6 years and 11.6% for 7–9 years. None had been married for 10 years or more.

Table 2. *Knowledge of mHealth Mobile Apps for Family planning*

Item	True	False	I Don't Know	Knowledge (True)
Family planning apps can track menstrual cycles and predict fertile days.	73	20	28	60.3%
These apps provide information about different contraceptive methods (e.g., pills, injections, condoms).	69	22	30	57.0%
Family planning apps can send reminders to take contraceptive pills or attend clinic appointments.	67	25	29	55.4%
Some apps allow users to log symptoms or side effects related to family planning methods.	62	28	31	51.2%
Family planning apps can offer educational content about sexual and reproductive health.	75	18	28	62.0%
These apps can connect users to nearby health services or clinics for family planning support.	59	30	32	48.8%

Note. $N = 121$. Knowledge was based on the proportion of correct (True) responses.

The table indicates a moderate level of knowledge of mHealth mobile applications for family planning among the respondents. Knowledge was highest regarding the use of family planning apps to provide educational content on sexual and reproductive health (62.0%), followed by their ability to track menstrual cycles and predict fertile days (60.3%). More than half of the respondents also knew that such apps provide information on contraceptive methods (57.0%) and send reminders for contraceptive pill intake or clinic appointments (55.4%). Knowledge was comparatively lower regarding the ability of apps to enable users to log symptoms or side effects associated with family planning methods (51.2%). The lowest level of knowledge was recorded for the ability of these apps to connect users with nearby health services or clinics (48.8%), indicating that more than half of the respondents were either incorrect or uncertain about this function.

Table 3. *Extent of Use of mHealth App among the Respondents*

Response Option	Number of Respondents	Percentage (%)
Not at all	10	8%
Rarely	10	8%
Sometimes	60	50%
Often	35	29%
Always	6	5%

Note. $N = 121$.

The table shows that mHealth app use among the respondents was predominantly occasional rather than consistent. Nearly half of the respondents (49.6%) reported using mHealth apps sometimes, while 28.9% used them often and only 5.0% reported using them always. This suggests that although mHealth apps have some level of uptake among the respondents, regular and sustained engagement remains limited. Notably, 16.6% reported either rarely using the apps (8.3%) or not using them at all (8.3%), indicating that a considerable minority have little or no engagement with mHealth applications.

Table 4. *mHealth Mobile App often Use by the Respondents*

App Name	Number of Respondents	Percentage (%)
Flo Period & Ovulation Tracker	55	45.5%
Clue	20	16.5%
Ovia Fertility	15	12.4%
Glow	10	8.3%
Natural Cycles	6	4.9%
Others	15	12.4%

Note. $N = 121$.

The table indicates that Flo Period & Ovulation Tracker was the most frequently used mHealth application, reported by 45.5% of the respondents. Its substantially higher use compared with the other applications suggests a concentration of respondents around one dominant app rather than an evenly distributed pattern of application use. Clue was the next most frequently used app (16.5%), followed by Ovia Fertility (12.4%) and Glow (8.3%). Natural Cycles accounted for only 5.0%, while 12.4% reported using other applications.

Table 4. *Level of Satisfaction with the Use of mHealth Applications for Family Planning among Respondents*

S/N	Satisfaction Statement	Very Satisfied	Satisfied	Neutral	Dissatisfied	Very Dissatisfied
1	Satisfaction with accuracy of information provided by the family planning app.	35 (28.9%)	50 (41.3%)	20 (16.5%)	10 (8.3%)	6 (5.0%)
2	Satisfaction with ease of navigation and use of the app.	30 (24.8%)	52 (43.0%)	22 (18.2%)	12 (9.9%)	5 (4.1%)
3	Satisfaction with reminders and alerts helping manage contraceptive schedules.	32 (26.4%)	48 (39.7%)	25 (20.7%)	10 (8.3%)	6 (5.0%)
4	Trust in the app's protection of personal and health data security.	10 (8.3%)	20 (16.5%)	30 (24.8%)	35 (28.9%)	26 (21.5%)
5	Feeling of control over family planning decisions due to app usage.	33 (27.3%)	50 (41.3%)	22 (18.2%)	10 (8.3%)	6 (5.0%)
6	Overall satisfaction with the experience of using the family planning app.	31 (25.6%)	50 (41.3%)	24 (19.8%)	10 (8.3%)	6 (5.0%)

Note. *N* = 121.

The findings indicate a generally favourable level of satisfaction with mHealth applications for family planning, particularly regarding the accuracy of information (70.2%), ease of navigation and use (67.8%), reminders and alerts (66.1%), and users' sense of control over family planning decisions (68.6%). Overall satisfaction with the app experience was also relatively high, with 66.9% reporting that they were satisfied or very satisfied. However, satisfaction with personal and health-data security was notably lower, with only 24.8% satisfied or very satisfied, compared with 50.4% who were dissatisfied or very dissatisfied. This suggests that while respondents generally valued the functionality and usefulness of mHealth applications, concerns about data privacy and security remained a significant limitation to user satisfaction.

Discussion of Findings

The first objective was designed to establish the knowledge of respondents about mHealth mobile apps for family planning. The findings indicate that married undergraduate women at COOU have a moderate understanding of the functions offered by family planning apps. Many respondents were aware that these apps can track menstrual cycles, predict fertile days, and provide educational content on sexual and reproductive health. More than half also recognised that the apps provide information on contraceptive methods and send reminders for medication or clinic appointments. However, knowledge was less widespread regarding features such as logging symptoms or side effects and connecting users to nearby health services. This finding aligns with Vanestanagh et al. (2021), who reported that mHealth tools can improve reproductive health knowledge, although their specific impact on family planning may be limited by cultural and content-relevance factors. Similarly, Abrejo, et al. (2022), emphasised the importance of tailoring mHealth content to users' cultural context and literacy levels to enhance acceptability and effectiveness. These observations resonate with the moderate knowledge recorded in the present study. From the perspective of Diffusion of Innovations (DOI) theory, knowledge represents the first stage of the innovation-decision



process. The moderate level of awareness observed suggests that respondents have acquired basic knowledge of mHealth applications but may require more targeted information and engagement to progress towards stronger adoption.

The second objective sought to assess the extent to which respondents used mHealth apps for family planning. The findings revealed that the majority of married undergraduate women at COOU used the apps moderately, with the largest proportion reporting that they used them “sometimes”, followed by those who used them “often”. This suggests that although the apps have gained some acceptance, they have not yet become fully integrated into respondents’ routine reproductive health practices. The pattern of intermittent use is consistent with the Diffusion of Innovations (DOI) theory, which explains adoption as a process involving knowledge, persuasion, decision, implementation, and confirmation. The observed level of use suggests that many respondents may be at the implementation stage, where they have begun applying the innovation but have not necessarily incorporated it into their routine practices. This finding is consistent with Nwafor, et al. (2022), who found that mHealth tools, including the Flo app, were known and used among university students in Nigeria, although usage remained moderate. Similarly, Chukwu et al. (2021) reported modest use of mHealth for reproductive health in Sierra Leone, with accessibility, user familiarity, and relevance to users’ everyday needs influencing utilisation. These findings suggest that awareness of mHealth applications does not automatically translate into sustained or frequent use.

The third objective was to identify the mHealth mobile apps used among married undergraduate women at COOU. The findings revealed that Flo Period & Ovulation Tracker was the most frequently used application among the respondents, while Clue and Ovia Fertility accounted for smaller proportions, and Glow and Natural Cycles recorded comparatively lower levels of use. This finding is consistent with Nwafor, et al. (2022), who reported the use of Flo among Nigerian university students, suggesting its established presence within this population. From the DOI perspective, the prominence of Flo may be associated with perceived relative advantage, compatibility, and familiarity, which are among the attributes that can influence the diffusion of an innovation. The lower use of other applications may similarly reflect differences in users’ familiarity with the apps, perceived usefulness, accessibility, or compatibility with their reproductive health needs.

The fourth objective sought to determine the level of satisfaction with the use of mHealth apps for family planning. The findings show generally favourable satisfaction with the accuracy of information, ease of navigation, reminders and alerts, users’ sense of control over family planning decisions, and the overall app experience. However, satisfaction with the protection of personal and health data was notably lower, with a substantial proportion of respondents expressing dissatisfaction or uncertainty about data security. The positive assessment of app functionality is consistent with Nuwamanya et al. (2020), who reported the potential of mobile applications to support sexual and reproductive health behaviours and outcomes. This finding can be interpreted in relation to the DOI attributes of relative advantage and compatibility, as respondents appear to recognise practical benefits in using the applications. On the contrary, concerns about privacy and data security may constrain sustained adoption despite satisfaction with the functional aspects of the apps. This concern is consistent with Ezeah and Vincent (2025), who identified trust and technological barriers as factors that can inhibit mHealth adoption in Nigeria.



Conclusion and Implications

The study demonstrates that married undergraduate women at Chukwuemeka Odumegwu Ojukwu University have moderate knowledge and use of mHealth apps for family planning, with the Flo app being the most frequently used. However, important gaps remain in knowledge of some app features, particularly symptom monitoring and linkage to health services, while concerns about personal and health-data security constitute a notable limitation to user satisfaction. These findings suggest that broader and sustained adoption of mHealth apps for family planning requires greater attention to culturally relevant content, user education, and privacy and data-security safeguards. Addressing these issues could enhance users' confidence, satisfaction, and continued engagement with mHealth applications, thereby strengthening their potential contribution to family planning and reproductive health.

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AI Use Declaration:

ChatGPT was used to improve grammar and clarity of ideas. The author takes full responsibility of the work.
