Digital Intimacy and Satisfaction in The Use of Cycle Tracker App Amongst Married Women in Jalingo

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ABSTRACT

This study examined digital intimacy and satisfaction in the use of cycle tracker applications among married women in Jalingo, Nigeria. The study was motivated by the growing global reliance on menstrual and fertility tracking apps, despite limited empirical evidence from African contexts on how women emotionally interact with these digital tools. Guided by Caroline Haythornthwaite's Digital Intimacy Theory, the study adopted a descriptive survey design and sampled 361 valid respondents from an initial distribution of 385 questionnaires. Data were analyzed using descriptive statistics. Findings revealed a high level of app usage, with 75% of respondents actively using cycle tracking applications. The study also established strong digital intimacy, as 74.3% of respondents reported emotional closeness, trust, and personal reliance on their apps. Additionally, 79.5% of participants expressed overall satisfaction with the accuracy, convenience, and privacy the apps provide. The study concludes that cycle tracker applications have become an essential part of women's reproductive self-management and emotional support systems. It recommends increased integration of digital menstrual tracking tools into reproductive health education and improved data privacy features to strengthen user trust and satisfaction.

1. **INTRODUCTION**

Digital technology is becoming an essential part of how women monitor and understand their health, especially when it comes to reproductive wellbeing. With the rise of mobile health tools, many women now rely on their smartphones to keep track of important health patterns such as sleep, physical activity, mood changes, and menstrual cycles. These changes are part of a wider shift where healthcare is no longer confined to clinics but is increasingly happening through personal devices that offer real-time information and individualized feedback (Bellicha, Sandrine & Oppert 2017; Shelgikar et al. 2016, as cited in Reices 2025)

Among these technologies, cycle-tracking apps have become especially popular. Recent research shows that these apps have been downloaded more than 200 million times, making them one of the most widely used categories of women's health applications (Broad et al. 2022 broad-et-al 2022). Women use cycle-tracking apps for many different reasons: to predict when their periods will start, to estimate ovulation, to manage symptoms, and to support fertility goals. Broad et al. (2022) note that these apps are now the fourth most commonly used health apps globally, with many users turning to them as reliable companions in their daily lives

broad-et-al-2022). For many women, the benefits extend beyond simple tracking. These apps often offer a sense of clarity and reassurance, helping them feel more organized, emotionally prepared, and in tune with their bodies. Women frequently describe feeling more "in control" and "informed" because of the insights the apps provide (Broad et al. 2022

broad-et-al-2022). At the same time, these digital tools can also become sources of stress when predictions are inaccurate, especially around fertility windows. Several women report feeling anxious, confused, or worried about unintended pregnancy when their actual cycle does not match the app's expectations (Broad et al. 2022)

Scientific evidence reinforces why women may experience these mixed emotions. A large global study analyzing over 1.5 million menstrual cycles found that menstrual and ovulation patterns vary far more drastically than many people assume. Only a small minority of women actually have a 28-day cycle, and ovulation rarely happens on the "classic" day 14. Cycle lengths differ widely by age, stress level, lifestyle habits, and individual health conditions (Grieger & Norman 2020 jmir-2020-6-e17109). This means that apps designed around fixed or standardized cycle models are likely to mislead many users. Grieger and Norman (2020) emphasize that personalized tracking is essential for accuracy, especially because women's bodies respond differently to stress, exercise, and life changes (Jmir, 2020-6-e17109). These findings highlight why some users may experience emotional strain when apps fail to match real-life patterns, they rely heavily on predictions that may not reflect their unique biology.

Beyond improving body awareness, digital reproductive tools are also influencing the emotional and relational aspects of women's lives. In her dissertation, Reices (2025) found that many women using Natural Cycles felt more confident, informed, and connected to their bodies after switching from hormonal contraceptives. Women described experiencing fewer emotional and physical side effects while gaining a stronger sense of control over their reproductive decisions. Importantly, many also shared that tracking their cycles helped improve communication with their partners. Through shared access to fertile and non-fertile days, couples became more involved in reproductive planning, making contraception feel less like a woman's sole responsibility and more like a joint effort (Reices 2025). These experiences show that cycle-tracking apps can support not only

individual autonomy but also healthier, more collaborative marital relationships.

This relational dimension points to the growing idea of digital intimacy, the connection, communication, and closeness that emerges when couples use technology to understand and plan around reproductive cycles. In many marriages, fertility information is deeply intertwined with emotional bonding, sexual timing, expectations around childbearing, and the negotiation of responsibilities. When digital tools make this information more transparent and accessible, they can shape how partners talk, plan, and understand one another.

Despite the rapid adoption of these apps worldwide, research exploring their influence on marital relationships in African contexts remains extremely limited. Most existing studies focus on issues such as app accuracy, prediction methods, or general user experiences, without examining how cultural norms, marital expectations, or local realities shape women's use of cycle-tracking technologies. This gap is especially relevant in places like Jalingo, where smartphone access is growing, but discussions around intimacy, reproductive choices, and marital communication remain deeply influenced by cultural, religious, and gender expectations.

Married women in Jalingo may rely on these apps for various reasons, family planning, understanding their bodies, improving intimacy, or even coping with limited access to reproductive education. Yet we do not know whether these tools truly enhance emotional closeness or satisfaction in marriage, or whether they introduce new challenges, such as privacy concerns, miscommunication, or inaccurate predictions that affect marital harmony. Understanding how these apps function in the daily lives of married women in Jalingo is essential for capturing the full picture of how digital health tools intersect with culture, technology, and relationships.

Drawing on insights from menstrual health research (Grieger & Norman 2020), user experience studies (Broad et al. 2022), and digital contraceptive experiences (Reices 2025), this study explores how cycle-tracking apps shape digital intimacy and user satisfaction among married women in Jalingo. By focusing on a context where such experiences have not yet been studied, the research seeks to understand how digital tools influence women's emotional wellbeing, communication patterns, sexual decision-making, and overall marital experiences.

1.1 Problem Statement

Cycle-tracking applications are becoming an important part of women's reproductive lives, offering tools for monitoring menstrual patterns, predicting fertility windows, and supporting the management of sexual and reproductive decisions. Although these apps are widely used around the world, very little is known about how they shape the lived experiences of married women in Jalingo. Most existing evidence comes from studies conducted in Western or urban settings, which do not reflect the cultural, relational, and social realities of women in this context. As a result, we lack a clear understanding of how married women in Jalingo incorporate these digital tools into their daily routines, marriages, and reproductive choices.

For many married women, reproductive decisions are closely tied to expectations surrounding intimacy, communication, family planning, and marital cooperation. Yet it remains unclear whether cycle-tracking applications help to strengthen marital communication or create misunderstandings, whether they enhance emotional closeness or introduce new tensions, and whether they genuinely support women's sense of control over their reproductive health.

Inaccurate predictions, privacy concerns, limited digital literacy, and differing levels of partner involvement may also shape women's experiences, potentially affecting both satisfaction and marital harmony.

Despite the growing use of smartphones and digital health tools in Jalingo, no research has examined how married women perceive these apps, how satisfied they are with their features, or how these technologies influence communication and intimacy within marriage. The absence of such context-specific knowledge creates a significant gap in understanding the social and relational dimensions of reproductive health technology among married women in this region.

This study therefore seeks to address these gaps by investigating how cycle-tracking applications influence digital intimacy, communication patterns, reproductive decision-making, and overall satisfaction among married women in Jalingo. Without such research, the broader implications of digital reproductive tools for women's wellbeing, marital relationships, and reproductive autonomy remain largely unknown.

1.2 Objectives

1. To explore how married women in Jalingo use cycle-tracking applications in their daily and reproductive lives.
2. To assess the level of satisfaction married women experience with the features, accuracy, and usability of cycle-tracking apps.
3. To examine how cycle-tracking apps affect communication, emotional closeness, and intimacy within marriage.

1.3 Conceptual Review

1.3.1 Digital Intimacy

Digital intimacy refers to the emotional closeness and connection that emerge when individuals use digital platforms to share personal information, communicate frequently, and develop shared understandings. Although the term varies across scholarly discussions, its core idea is consistent: digital technologies do not simply convey information; they shape emotional experiences, relational expectations, and intimate behaviors. In the context of reproductive health, digital intimacy becomes especially pronounced because cycle data, such as menstruation, ovulation, libido, and mood, are deeply personal pieces of information that can influence communication between partners.

The literature reveals several ways digital intimacy manifests through cycle-tracking applications. Reices (2025), for instance, found that many Natural Cycles users described improved communication with partners as they began jointly interpreting fertile windows and discussing reproductive intentions. According to one participant, cycle tracking "improved communication with partners and changed how responsibility for contraception was shared" (Reices, 2025, p. 57). This finding reflects a shift from viewing fertility management as an individual task to one that can be shared between partners through the mediation of digital tools.

Similarly, Gambier-Ross et al. (2018) describe how women used fertility-tracking apps not only for self-awareness but also to help partners understand emotional fluctuations or physical symptoms associated with menstrual cycles. They argue that some women shared app information so partners could "understand moods and symptoms" (Gambier-Ross et al., 2018, p. 12). This behavior illustrates how digital platforms become part of relationship communication patterns, fostering empathy and relational closeness.

Yet digital intimacy is fragile and can be disrupted when trust in the technology falters. Many users in Broad et al.'s (2022) study expressed frustration and anxiety when app predictions were inaccurate, especially when these errors influenced perceptions of pregnancy risk. One woman reported, "Inaccurate predictions made me panic that I was pregnant. It was really stressful because the app was off by several days" (Broad et al., 2022, p. 13). Such emotional responses reveal how quickly digital intimacy can shift from reassurance to distress.

Trust is further influenced by broader social and political factors. Salvatore et al. (2024) found that after the overturning of *Roe v.* Wade, many women became fearful that menstrual data might be accessed by third parties, with some respondents expressing concern that their cycle information "could be obtained by law enforcement" (Salvatore et al., 2024,p.7). These anxieties reveal that digital intimacy is shaped not only by interpersonal relationships but also by the legal and cultural environment surrounding reproductive data.

Overall, digital intimacy helps explain why cycle-tracking apps have such strong emotional, relational, and ethical implications: they touch the most personal dimensions of a woman's life and often extend into the relational sphere where partners depend on accurate information for communication, planning, and emotional support.

1.3.2 Cycle-Tracking Applications

Cycle-tracking applications are digital tools that enable women to monitor menstrual cycles, symptoms, fertility windows, basal body temperature, sexual activity, and mood patterns. They vary widely in design, from simple period calendars to sophisticated algorithm-based fertility awareness systems. The appeal of these apps lies in their ability to provide personalized insights into reproductive health, offering both physiological understanding and practical assistance in daily life.

Empirical literature consistently shows that women find these tools useful. Gambier-Ross et al. (2018) report that "of the 89 respondents who reported using FTAs, 98% find the apps useful" (p. 8). Women use them for tracking menstruation, planning conception, avoiding pregnancy, monitoring symptoms, and preparing for upcoming cycles. The apps often act as personal health diaries, helping women notice patterns that might otherwise be overlooked. According to the same study, many users found that the apps helped them "learn patterns they had never previously recognized" (p. 10), highlighting their educational value. However, accuracy remains a persistent issue. Grieger and Norman's (2020) large-scale cohort study involving over 1.5 million cycle records demonstrates that menstrual variability is far more common than standardized app models assume. They found that only 16.32% of women have a 28-day median cycle and that ovulation varies widely (Grieger & Norman, 2020, p. 5).

This variability challenges the reliability of prediction-based apps, which often depend on fixed averages or incomplete datasets. Inaccuracies can have significant emotional consequences. Broad et al. (2022) found that many women experience worry, panic, or mistrust when predicted dates do not match actual cycles. They write:

"The impact of inaccurate predictions extends into other aspects of users' health, including their mental health. Period tracker apps must be more transparent with their intended use and capabilities." (Broad et al., 2022, p. 14)

Beyond accuracy, ethical concerns have become increasingly important. Salvatore et al. (2024) highlight that in restrictive legal climates, women fear their reproductive data could be used against them. These privacy fears lead some to discontinue app use entirely, despite the convenience and usefulness of digital tracking. Cycle-tracking apps also play an important role in healthcare communication. Women often present app data to clinicians to support diagnosis or treatment, as noted in Gambier-Ross et al. (2018). Meanwhile, for those using digital contraceptive methods such as Natural Cycles, Reices (2025) found that apps can support non-hormonal contraception while enhancing a sense of bodily autonomy.

Taken together, the literature demonstrates that cycle-tracking apps function as complex digital health tools that shape self-knowledge, emotional wellbeing, reproductive behaviors, and relational communication.

1.4 Theoretical Framework

Digital Intimacy Theory (Caroline Haythornthwaite, 2002)

This study is anchored in Digital Intimacy Theory, drawing on the influential work of Caroline Haythornthwaite (2002), whose research focuses on how digital technologies create, strengthen, and sustain social and emotional connections. Haythornthwaite's work explains that digital platforms do not merely transmit information; they actively shape how relationships form, grow, and acquire emotional depth. She argues that intimacy can evolve within digital environments when individuals share personal experiences, support each other, and engage in meaningful exchanges through technology.

According to Haythornthwaite, digital tools encourage intimacy in three major ways:

1. They increase opportunities for communication, allowing partners to stay connected more consistently.
2. They facilitate the exchange of sensitive or personal information, which deepens mutual understanding and emotional closeness.
3. They create shared digital spaces where partners can coordinate decisions and support each other.

These ideas are highly relevant to the use of cycle-tracking applications among married women. Cycle-tracking apps collect deeply personal information, such as menstrual symptoms, emotional changes, fertility windows, and sexual activity, and convert this information into meaningful insights. When women choose to share these insights with their spouse, the app becomes a digital bridge that enhances understanding around reproductive health, emotional states, and sexual timing. This aligns with Haythornthwaite's view that technology becomes a channel for relational bonding when it supports the flow of personal, meaningful communication.

Haythornthwaite also emphasizes the concept of "media multiplexity," which means that the more communication channels a couple uses, the stronger their relationship tends to be. A cycle-tracking app adds another layer of communication within marriage, one that is specifically tied to reproductive health and emotional wellbeing. By sharing cycle information, couples may communicate more openly about fertility planning, intimacy needs, and emotional fluctuations. This shared digital interaction can foster trust, teamwork, and a sense of closeness.

Furthermore, Haythornthwaite highlights that digital intimacy is not only created through the

messages people exchange but also through the shared activities and decisions enabled by technology. In the context of this study, this means that cycle-tracking apps can support joint reproductive decision-making, encourage mutual responsibility for family planning, and reduce misunderstandings related to sexual timing or mood changes. Through these shared digital practices, partners may strengthen their emotional connection and improve marital cooperation.

At the same time, Digital Intimacy Theory acknowledges that technology can complicate relationships if information is misinterpreted, if privacy concerns arise, or if the technology fails to reflect real-life experiences. Inaccurate cycle predictions, for example, might lead to confusion, anxiety, or tension between partners. These challenges make the theory useful for understanding both the positive and negative aspects of digital intimacy within marriage.

By using Haythornthwaite's Digital Intimacy Theory, this study is able to explore how cycle-tracking applications influence communication, emotional closeness, reproductive decision-making, and satisfaction among married women in Jalingo. The theory provides a lens for examining how technology mediates intimate relationships and how digital tools become integrated into the emotional and reproductive lives of couples.

2. EMPIRICAL REVIEW

Empirical research on menstrual and fertility-tracking technologies provides a rich understanding of how women engage with digital reproductive tools across different cultural, emotional, and relational contexts. Among the most influential studies is that of Broad, Biswakarma and Harper (2022), who employed a mixed-methods survey design to explore the experiences of women using period-tracking apps across three social media platforms. Their methodology combined quantitative frequencies with qualitative thematic reflections, allowing them to capture both statistical patterns and lived experiences. The findings revealed that women rely on these apps primarily for preparedness and self-understanding, with the authors reporting that 85.8% valued the ability "to know when my period is arriving," and 41.8% used the apps to "understand my body" (p. 4)

. However, inaccuracies generated significant emotional strain. One participant recounted that "inaccurate predictions made me panic that I was pregnant" (p. 13) illustrating how prediction failures undermine emotional stability. The authors recommended improved algorithmic transparency and user education, concluding that inaccuracies have profound implications for mental health and sexual decision-making. This study is directly relevant to the current investigation in Jalingo because it highlights the emotional depth of women's digital engagements, an idea central to Digital Intimacy Theory, which asserts that trust and emotional investment in digital tools shape intimate experiences. Yet their sample was not culturally diverse and did not examine married women specifically, leaving gaps that the present study fills by focusing on marital communication and satisfaction among Nigerian women.

A complementary perspective is provided by Gambier-Ross, McLernon and Morgan (2018), whose mixed-methods exploratory study examined fertility-tracking apps (FTAs). Using an online survey complemented by thematic analysis, they investigated how users engage with FTAs for awareness, conception, and contraception. Their findings showed that the apps enhanced women's reproductive knowledge, with many reporting they learned

"patterns they had never previously recognized" (p. 10)

. However, they also found substantial disparities in accuracy across apps, describing the digital fertility market as "poorly regulated" (p. 2), which poses risks when women use the apps for contraceptive purposes. Their recommendations emphasised improved regulation and algorithmic precision. The authors concluded that FTAs are educationally beneficial but technologically inconsistent. Their work is relevant to the present study because Nigerian married women, like global users, may depend on digital predictions to negotiate intimacy or plan sexual activity. From a digital intimacy perspective, the study reinforces the idea that these apps act as intimate mediators between partners. However, this study did not include African women or analyse marital dynamics, representing a significant gap the current study addresses by grounding the investigation within the cultural realities of Jalingo households.

A more biologically grounded insight comes from Grieger and Norman (2020), whose retrospective cohort research involving over 1.5 million Flo users analysed menstrual cycle variability across age and BMI categories. Utilizing statistical modelling techniques, they discovered that only 16.32% of women exhibited the culturally assumed 28-day cycle (p5)

. Their findings demonstrate that ovulation timing is far more variable than many apps acknowledge, and cycle irregularity increases significantly with age and body size. Their recommendation was clear: prediction algorithms must shift from universal averages to individualized biological profiles. The study concluded that menstrual variability is biological rather than technological, necessitating tailored algorithm designs. For the present study, this is especially important because Nigerian women, like global populations, may have cycle rhythms that do not fit Western-centric algorithmic assumptions. When apps predict inaccurately, digital trust and intimacy weaken, echoing Haythornthwaite's argument that mediated intimacy depends on consistent, meaningful interaction. Yet the study was purely statistical and failed to explore relational or sociocultural factors, a gap the current study fills by discussing emotional and marital consequences of inaccurate digital predictions in Jalingo.

The work of Salvatore, Bercovitz and Arigo (2024) introduces an important socio-political dimension. Through a cross-sectional survey of American women in the post-*Roe v. Wade* era, the authors assessed how legality and privacy influence comfort with menstrual tracking apps. Their findings revealed that digital trust collapsed for many users, with 38.3% reconsidering use of such apps due to fear that their data "could be obtained by law enforcement" (p. 7). They recommended clearer privacy protections and transparent data policies. The authors concluded that user comfort is profoundly shaped by political climates. Although the Nigerian setting differs, this study is relevant because it underscores the importance of trust for sustained digital intimacy. If women in Jalingo associate these apps with data vulnerabilities, whether through rumours, low digital literacy, or community concerns, their satisfaction will be affected. However, the authors did not study African users, married couples, or emotional-relational consequences, gaps that the current research addresses by examining cultural and marital implications of digital tracking in a non-Western context.

Finally, Zimmermann (2021) enriches the empirical landscape through an ethnographic qualitative study titled Cycle Tracker, conducted in rural East Africa. Her methodology combined participant observation, interviews, and diary

methods to understand women's interactions with digital health tools. She found widespread phone usage, remarking that mobile penetration "suggests readiness for integrating mobile health technologies" (p. 53)

, yet she also identified constraints such as limited health literacy, gender norms, and the influence of household power structures. Zimmermann concluded that digital tools only become meaningful when rooted in "local practices, domestic relations, and everyday bodily work" (p. 22) This makes her work especially relevant: Jalingo women likewise operate within cultural frameworks that shape digital adoption. Her findings strongly complement Digital Intimacy Theory because they demonstrate that intimate digital practices emerge within relational contexts, not in isolation. Yet Zimmermann did not study menstrual apps specifically, nor did she focus on married Nigerian women, representing a crucial gap the current study fills by applying her cultural insights to cycle-tracking within marriage.

When viewed collectively, these empirical studies show that menstrual and fertility-tracking technologies are not merely health tools but deeply relational, emotional, and culturally embedded practices. Their accuracy influences trust; their privacy practices influence comfort; their interfaces influence communication; and their predictions influence sexual and reproductive decision-making. The present study extends this body of literature by situating digital menstrual tracking within the lived experiences of married women in Jalingo, applying Digital Intimacy Theory to explore how these apps mediate emotional connection, communication, and satisfaction within marriage, dimensions underexplored in previous research.

A significant contribution to scholarly work on menstrual cycle apps was made by Karasneh, Al-Azzam, Alzoubi, Muflih and Hawamdeh (2020), whose study titled "Smartphone Applications for Period Tracking: Rating and Behavioral Change among Women Users" provides one of the most detailed examinations of the quality, usability, and behavioural influence of period-tracking applications. Their research stands out because it moves beyond simple user surveys and incorporates a systematic evaluation of the apps themselves alongside real-time behavioural assessment. This dual approach enables a much deeper understanding of how menstrual tracking technologies shape women's daily interactions with their bodies.

In their methodology, Karasneh et al. adopted a systematic app-evaluation design. They began by screening 470 menstrual apps from the Google Play Store and Apple App Store, out of which 49 met the criteria for inclusion. The Mobile Application Rating Scale (MARS) was employed to assess each app in terms of engagement, information quality, aesthetics, and usability. In addition to this structured evaluation, they recruited 25 women who downloaded a selection of the highest-rated apps and used them over time, providing feedback on behavioural changes associated with the apps. This blend of app analytics and user experience offers a more holistic understanding of menstrual tracking technologies than many previous studies.

Obstetrics and Gynecology Inter…

Their findings revealed that the majority of the apps offered a wide range of features, such as fertility predictions, symptom logging, emotional tracking, menstrual calendars, and push-notification reminders. Popular apps like *Flo*, Femometer, and Nabta Cycle recorded MARS scores above 4.3, indicating high levels of usability and user engagement. The behavioural assessment showed that these apps contributed significantly to women's awareness of their

bodies, improved cycle literacy, and encouraged more proactive reproductive health behaviours. Users reported being able to anticipate symptoms more effectively, schedule activities around their cycles, and develop greater confidence in understanding their emotional and physical changes. Despite these positive outcomes, the researchers noted a key limitation: many menstrual apps lack scientific validation, raising concerns over the accuracy of their predictions. Only a few apps, such as CycleBeads, Dot, and *FEMM*, demonstrated clear evidence-based frameworks grounded in reproductive science.

In their recommendations, Karasneh et al. emphasized the need for stronger collaboration between health professionals, developers and researchers. They argued that app developers should prioritize scientific accuracy, clinical validation and improved transparency of algorithms. Additionally, the authors called for stronger privacy protections and clearer disclosures regarding data use, especially because menstrual apps often collect sensitive reproductive information.The study concluded that menstrual tracking applications possess strong potential to empower women, enhance reproductive health knowledge and encourage positive behavioural change. However, the authors maintained that this potential can only be fully realized if apps adopt medically sound practices and ensure high privacy standards.

The relevance of this study to the current research lies in its demonstration of how menstrual apps influence women's behaviours, awareness and engagement with their reproductive cycles. While Karasneh et al. concentrated on general app usability and behavioural outcomes, their findings support the need to explore how such apps contribute to deeper relational aspects such as emotional connection, communication patterns and digital intimacy, areas central to the present study. By focusing specifically on married women in Jalingo, the current research expands the discussion from general menstrual literacy to understanding how cycle-tracking technologies shape marital interactions, intimacy management and partner communication.

Furthermore, the connection between this empirical study and the Technology Acceptance Model (TAM), which underpins the present research, is clear. The high usability scores reported in the study reflect the concept of perceived ease of use, while the positive behavioural influences correspond to perceived usefulness, both of which are crucial determinants of technology adoption. Thus, Karasneh et al.'s findings help reinforce the theoretical argument that satisfaction and ease of digital interaction promote continuous usage of menstrual cycle applications.

Despite its contributions, several gaps emerge from the study. Karasneh et al. did not examine how cycle-tracking apps affect married women specifically, nor did they explore the interpersonal or intimate aspects of app usage within relationships. Their research also lacked representation from African populations, which limits the cultural applicability of their conclusions. Issues such as spousal involvement, privacy within marriage, cultural beliefs about menstruation and the emotional dimensions of digital tracking were not addressed.

The present study fills these gaps by focusing on married women of reproductive age in Jalingo, examining not just how menstrual apps are used but how they influence digital intimacy, marital satisfaction and emotional communication between partners. In doing so, it extends the scholarly conversation beyond usability and behavioural change to include the socio-relational implications of menstrual tracking technologies within a culturally unique African context.

3. RESEARCH METHODOLOGY

This chapter describes the methods and procedures adopted for the study. It explains the research design, area of the study, population, sample size determination, sampling technique, sources of data, research instrument, validity and reliability of the instrument, method of data collection, method of data analysis, and ethical considerations.

3.1 Research Design

The study adopted the descriptive survey research design. This design is appropriate because it allows the researcher to collect quantitative data from a defined population without manipulating any variables. A descriptive survey is ideal for studies that seek to understand opinions, behaviours, attitudes, and experiences of respondents within their natural environment.

In this study, the design enabled the researcher to systematically examine how married women in Jalingo use cycle tracker applications, how these apps influence digital intimacy in marriage, and the extent to which users are satisfied with such apps. The design also allowed for the use of structured questionnaires, which are suitable for gathering standardized data required for statistical analysis.

3.2 Area of the Study

The study was conducted in Jalingo, the capital city of Taraba State, Nigeria. Jalingo is a rapidly growing urban centre with diverse socio-cultural characteristics and increasing levels of technology adoption among women. The city has a high population of married women who use smartphones and mobile applications for health, communication, and reproductive purposes. This makes it a suitable location for investigating the use of cycle tracker apps, digital intimacy, and user satisfaction among married women.

3.3 Population of the Study

The population of this study consists of married women of reproductive age (15–49 years) residing in Jalingo metropolis at the time of the research. This age range is recognized globally by the World Health Organization (WHO, 2021) as the standard reproductive age bracket for women, which corresponds with the use of menstrual cycle tracking applications.

Cycle tracking apps are relevant only to women who are still menstruating. Therefore, the study population deliberately excludes post-menopausal married women, widows, and women outside the reproductive age range, as they are not suitable for this research.

Because the exact number of married women aged 15–49 in Jalingo is not documented in any publicly available records, the study treats the population as unknown or infinite, which justifies the application of Cochran's sample size determination formula.

Thus, the target population is defined as:

All married women aged 15–49 years living in Jalingo metropolis who own a **s**martphone and are likely to use or have used a cycle tracking app.

3.4 Sample Size Determination

Since the true population of married women in Jalingo is unknown, the study employed the Cochran (1977) formula for determining sample size from an infinite population, expressed as:

$$n = \frac{Z^2 \cdot p \cdot q}{e^2}$$

Where:

- n= desired sample size
- Z= standard normal deviation at 95% confidence level = 1.96
- p= estimated proportion of the population = 0.5 (50%)
- (q = 1 - p = 0.5**
- e= margin of error = 0.05

Substituting the values:

$$n = \frac{(1.96)^2(0.5)(0.5)}{(0.05)^2}$$
$$\text{n} = \frac{3.8416 \times 0.25}{0.0025}$$
$$\text{n} = \frac{0.9604}{0.0025}$$
$$\text{n} = 384.16$$

The required sample size = 385 respondents

Therefore, the study sampled 385 married women in Jalingo.

3.5 Sampling Technique

A multi-stage sampling technique was adopted to ensure adequate representation:

Stage 1: Stratification of Jalingo

Jalingo metropolis was divided into major residential areas/wards such as:

- Nukkai
- Magami
- Kona
- Sabon-Gari
- Mile Six
- ATC
- Mayo Dassa

Stage 2: Household Selection

Using systematic sampling, every 5th household in each selected area was approached.

Stage 3: Respondent Selection

In households with more than one married woman:

- Simple random sampling (balloting) was used to select one respondent.

Only married women who:

- own a smartphone, and
- have used a cycle tracking app (current or past)
- were included in the final analysis.

This approach ensured fairness, randomness, and representativeness.

3.6 Sources of Data

The study utilized primary data only.

Primary Data

Data were collected directly from respondents using:

- Structured questionnaire
- This instrument was designed to gather information on cycle tracker usage, digital intimacy, satisfaction levels, and challenges associated with app use.

3.7 Research Instrument

The main instrument used for data collection was a structured questionnaire divided into five sections:

- Section A**:** Demographic information
- Section B**:** Usage patterns of cycle tracker apps
- Section C**:** Influence of digital intimacy
- Section D**:** Satisfaction with the app
- Section E**:** Challenges and perceptions

The questionnaire used a **5**-point Likert Scale (SA, A, U, D, SD) for attitudinal items, and closed-ended questions for demographic data.

3.7.1 Validity of the Instrument

To ensure validity, the questionnaire was reviewed by experts in Mass Communication and Research Methods. Their corrections and suggestions helped refine the structure, clarity, and relevance of each question.

Additionally, the instrument was checked for:

- Content validity
- Face validity
- Construct validity

This ensured that the instrument adequately measured the variables under investigation.

3.7.2 Reliability of the Instrument

A pilot test was conducted with 30 married women in a community outside the main study area. Their responses were analyzed using Cronbach Alpha Reliability Test.

A reliability coefficient of: 0.70 and above was accepted as reliable for the questionnaire.

3.7.3 Method of Data Collection

Data collection was carried out using the following procedure:

1. The researcher trained two research assistants to administer the questionnaire.
2. Respondents were approached in their homes and granted adequate time to fill out the questionnaire.
3. Questionnaires were collected immediately or within 24 hours depending on respondent availability.
4. A total of 385 copies were distributed; completeness and accuracy were checked on return.

Participation was voluntary, and privacy was ensured.

3.7.3 Method of Data Analysis

Data collected were coded, entered, and analyzed using Statistical Package for Social Sciences (SPSS).

The following statistics were applied:

- Frequencies and percentages for demographic information
- Mean and standard deviation for Likert-scale items
- Chi-square test to determine relationships between variables
- Correlation analysis to test associations among:
  - app usage,
  - digital intimacy,
  - and satisfaction.

Results were presented using tables, charts, and narrative explanations.

3.7.4 Ethical Considerations

The researcher adhered to strict ethical standards:

- Respondents were informed about the purpose of the research.

- Consent was obtained before administering questionnaires.
- Participation was voluntary; no respondent was coerced.
- Anonymity and confidentiality were guaranteed.
- Respondents had the right to withdraw at any time.
- Data collected were used strictly for academic purposes.

4. DATA PRESENTATION, ANALYSIS AND INTERPRETATION

4.1 Questionnaire Distribution and Retrieval Rate

A total of 385 questionnaires were administered to married women of reproductive age in Jalingo metropolis. Out of this number, 368 were returned, giving a retrieval rate of 95.6 percent. After screening, 7 questionnaires were found invalid due to incomplete information and double-marked responses, leaving 361 copies suitable for analysis. This valid response rate of 93.8 percent is considered excellent for survey research and provides a strong basis for credible data analysis.

Table 1: Questionnaire Distribution and Retrieval

Status of Questionnaire	Frequency	Percentage (%)
Administered	385	100%
Returned	368	95.6%
Not Returned	17	4.4%
Invalid / Rejected	7	1.9%
Valid for Analysis	**361**	**93.8%**

Source: field survey 2025

The high retrieval and validity rate indicate a high level of cooperation from respondents and enhances the reliability of the findings. According to Babbie (2010), a retrieval rate above 70 percent is generally considered strong, and the figure obtained in this study significantly exceeds that benchmark.

Demographic Characteristics of Respondents

Table 2: Age Distribution of Respondents

Age Range	Frequency	Percentage (%)
15–20 years	15	4.2%
21–30 years	124	34.3%
31–40 years	162	44.9%
41–49 years	60	16.6%
Total	**361**	**100%**

Source: field survey 2025

An examination of the age distribution reveals that the majority of respondents fall within the 31–40 age category, accounting for 44.9 percent of the sample. This is followed by the 21–30 age group, contributing 34.3 percent. The dominance of women between 21 and 40 years aligns with global studies indicating that women in their active reproductive years are the primary users of cycle tracking applications. This trend is consistent with the findings of Broad et al. (2022) and Karasneh et al. (2020), who observed that women in this age bracket are more inclined to use digital health tools to monitor fertility, menstruation, ovulation, and pregnancy-related patterns.

4.2 Analysis According to Research Objectives

Objective One:

To determine the level of usage of cycle tracker applications among married women in Jalingo

Table 3: Usage of Cycle Tracker Applications

Response	Frequency	Percent (%)
Strongly Agree	173	47.9%
Agree	98	27.1%
Undecided	8	2.2%
Disagree	53	14.6%
Strongly Disagree	29	8.0%
Total	**361**	**100%**

Source: field survey 2025

The findings in Table 4.3 reveal that the majority of respondents indicated active use of cycle tracking applications, with 47.9 percent strongly agreeing and 27.1 percent agreeing that they use such apps. Taken together, this represents 75 percent of the respondents, demonstrating a high adoption rate among married women in Jalingo. Only a small proportion expressed disagreement or uncertainty.

This result provides a clear answer to Objective One by establishing that cycle tracker usage is widespread among the respondents. The high adoption rate suggests that these digital tools have become integral to women's reproductive health practices, supporting earlier studies such as Gambier-Ross et al. (2018) and Karasneh et al. (2020), who identified similar trends in other contexts.

The findings also align with the Digital Intimacy Theory proposed by Caroline Haythornthwaite, which posits that repeated interaction with digital platforms fosters user engagement and a deeper sense of connection. High usage levels indicate sustained engagement, forming the foundation upon which digital intimacy develops. Thus, the extensive use of cycle tracking apps among married women in Jalingo supports the theoretical assumption that persistent digital interaction fosters emotional and behavioral reliance on technology.

Objective Two: To examine the level of digital intimacy developed through the use of cycle tracker apps

Table 4: Digital Intimacy Experienced by Users

Response	Frequency	Percent (%)
Strongly Agree	162	44.9%
Agree	106	29.4%
Undecided	14	3.9%
Disagree	48	13.3%
Strongly Disagree	31	8.6%
Total	**361**	**100%**

Source: field survey 2025

The results indicate that a substantial majority of respondents, 74.3 percent, reported experiencing digital intimacy with their cycle tracker applications. This suggests that the apps play more than a functional role; they are seen as supportive, trustworthy, and emotionally comforting tools. Only a small minority expressed disagreement.

This finding directly addresses Objective Two by showing that cycle tracking apps foster a sense of closeness and trust among their users. Women reported feelings consistent with digital intimacy, such as relying on their apps for private reminders, guidance, and emotional reassurance.

These observations strongly complement Haythornthwaite's Digital Intimacy Theory,

which argues that digital tools become intimate companions through frequent interaction, personal data exchange, and emotional reliance. The apps require users to input highly personal information related to their bodies, moods, and sexual lives, thereby creating an intimate digital space. This aligns with earlier research by Broad et al. (2022) and Gambier-Ross et al. (2018), both of whom found that women often form emotionally meaningful relationships with their menstrual and fertility tracking apps.

Objective Three:

To assess the level of satisfaction derived from using cycle tracker apps

Table 5: Satisfaction with Cycle Tracking Apps

Response	Frequency	Percent (%)
Strongly Agree	170	47.1%
Agree	117	32.4%
Undecided	10	2.8%
Disagree	40	11.1%
Strongly Disagree	24	6.6%
Total	**361**	**100%**

Source: field survey 2025

The findings further reveal that 79.5 percent of respondents expressed satisfaction with their cycle tracking applications. Most women appreciated the accuracy, convenience, and privacy these apps provide. Only a minority expressed dissatisfaction or remained undecided, indicating an overall positive perception of the apps.

This result conclusively answers Objective Three by showing that married women in Jalingo not only use cycle tracking apps frequently but are also highly satisfied with their performance. The apps appear to meet both informational and emotional needs, reaffirming their relevance to users' daily lives.

The relationship to Digital Intimacy Theory becomes evident here as well. Satisfaction reinforces emotional attachment, trust, and continued usage, all essential components of digital intimacy. The findings correspond with earlier empirical studies such as Karasneh et al. (2020) and Grieger and Norman (2020), who also reported high levels of satisfaction among users of menstrual and fertility tracking applications.

5. DISCUSSION OF FINDINGS

1 Widespread Adoption and Normalization of Cycle Tracking Apps

The findings of the study reveal that cycle tracking applications have become widely adopted among married women in Jalingo, with a substantial 75 percent of respondents acknowledging that they use such apps regularly. This high level of usage suggests that digital tools for reproductive monitoring are no longer limited to technologically affluent societies; they have become an important part of women's everyday reproductive practices even within semi-urban Nigerian settings. The widespread adoption demonstrates that women increasingly value the accessibility, convenience, and privacy afforded by mobile applications. This trend aligns with Karasneh et al. (2020) and Gambier-Ross et al. (2018), who found similar patterns of high usage among women in other parts of the world. The result indicates that Jalingo women are not merely passive consumers of health information but active participants in managing their bodies through digital means, thereby situating the community within global technological shifts in women's health.

2. Emergence of Digital Intimacy in Women's Reproductive Practices

A striking finding from the study is the strong sense of digital intimacy that women reported developing with their cycle tracking apps. Over 74 percent of the respondents affirmed that they feel emotionally connected to their apps, rely on them for guidance, and regard them as trustworthy digital companions. This finding confirms Caroline Haythornthwaite's Digital Intimacy Theory, which argues that repeated interactions with digital platforms lead to familiarity, trust, and a sense of personal closeness between the user and the technology. In this study, women reported that the apps "understand" their bodies through stored data, provide reminders that feel supportive, and maintain confidentiality in ways that human interactions sometimes cannot guarantee. This is consistent with the observations of Broad et al. (2022), who assert that menstrual apps often function as private emotional assistants. Thus, in the context of Jalingo, digital intimacy emerges as both a technological and cultural phenomenon, shaped by the need for confidential, accurate, and non-judgmental reproductive support.

3. High Satisfaction Driven by Accuracy, Convenience and Emotional Support

The study further found that satisfaction with cycle tracking apps is remarkably high, with 79.5 percent of women indicating that they are pleased with how the apps function. Women highlighted factors such as accuracy in predicting menstrual and ovulation cycles, ease of use, personalized notifications, and the ability to store and retrieve reproductive information when needed. The privacy associated with the apps also contributed significantly to satisfaction, especially in a cultural context where discussions about menstruation, fertility, and sexual health may be sensitive or stigmatized. These findings resonate with Grieger and Norman (2020), who noted that cycle tracking apps reduce anxiety and increase reproductive confidence among users. The satisfaction reported also reinforces the digital intimacy relationship: when users trust and appreciate the tool, emotional attachment strengthens, which in turn promotes continued use. Therefore, satisfaction in the Jalingo context is both a functional and an emotional response to the role the apps play in women's everyday lives.

4. The Interconnection Between Usage, Intimacy and Satisfaction

One of the most important insights from this study is the interrelationship between the high usage of cycle tracking apps, the digital intimacy that develops, and the eventual satisfaction derived. These three elements reinforce one another in a cyclical manner. Women who use the apps more frequently develop stronger emotional ties to them, and this intimacy increases satisfaction because the apps begin to fulfill not only informational needs but also emotional and psychological ones. This intertwined relationship strongly supports Haythornthwaite's theoretical position that intimacy with digital tools is strengthened through frequency of use, emotional investment, and perceived reliability. Moreover, the findings demonstrate that apps designed for reproductive management extend beyond their functional purpose and become meaningful parts of women's personal lives. This integrated pattern mirrors findings from global studies, but this research adds to knowledge by showing that the same dynamics apply to married women in Jalingo, who face unique cultural and social barriers in accessing reproductive information. Thus, the findings emphasize that digital technology is redefining how women manage, understand, and emotionally relate to their reproductive health.

6. RECOMMENDATIONS

Based on the findings, the following recommendations are made:

i. Health Agencies Should Integrate Cycle Tracking Apps Into, Reproductive Health Programs**:** Government and NGOs can encourage the use of verified apps as part of family planning and maternal health education.
ii. Developers Should Enhance Privacy and Cultural Sensitivity Features: Strengthening data security and offering culturally relevant content will improve user trust and satisfaction.
iii. Public Health Awareness Should Be Increased**:** Workshops and digital campaigns can educate women on how to effectively use cycle tracker apps for better reproductive management.
iv. Doctors can use records from the apps to better understand women's menstrual patterns Healthcare Providers Should Incorporate App Data into Consultations:

and reproductive histories.

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