Platforming PCOS Treatment Online: FemTech Logics of Care

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ABSTRACT

This paper explores how FemTech platforms appropriate the term 'care' to create a collaborative, non-judgmental, and data-driven approach for a sexual and reproductive health condition like Polycystic Ovary Syndrome (PCOS). In contrast, offline healthcare for PCOS is insufficient owing to disruptions in treatment, gynaecological indifference, and a lack of time and attention to patient concerns. We share findings from an ethnographic study conducted in India, involving interviews and observations with FemTech platform founders, gynaecologists, and people with PCOS. Our study highlights how FemTech start-ups, led by engineering and management professionals, establish a unified digital care approach by capitalizing on the shortcomings of traditional offline gynaecological healthcare infrastructures. We identify the logics of care surrounding FemTech platforms and assess their sustainability as digital alternatives to offline gynaecological care. We offer recommendations to FemTech founders and policymakers to build sustainable and inclusive offline and online health infrastructures.

CCS CONCEPTS

• **Human-centered computing → Empirical studies in HCI**.

KEYWORDS

FemTech, Care, PCOS, Women's Health, Gynaecology, India

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1 INTRODUCTION

The surge in the privatization of healthcare, technological progress, and research discourse on designing for women's health [1, 2, 8, 45, 51] has fueled the worldwide expansion of the FemTech industry [4]. Coined in 2016 by Ida Tin, the founder of the menstrual period tracking app Clue, 'FemTech' initially emerged as a niche domain to address the unmet healthcare needs of people assigned female at birth (AFAB) who have traditionally been underrepresented in both the medical and technology workforce [25].

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Of particular interest to this paper, are Indian FemTech platforms targeting Polycystic Ovary Syndrome (PCOS), a sexual and reproductive health (SRH) condition that is often described as a stigmatized [17, 72, 74] and enigmatic [52] chronic lifestyle disorder resulting in irregular menstrual cycles, hirsutism, cystic acne, weight gain, stress, and subfertility [9, 26]. Estimates suggest that in India, people who menstruate report higher incidences of PCOS, further exacerbated since the COVID-19 pandemic as compared to global figures [17, 18, 37, 72, 101].

Commonly experienced by the urban, middle-class, tech-savvy, millennials [72], PCOS has emerged as a popular condition to treat among FemTech platforms seeking a market to serve [5, 28]. Recent market reports highlight the swift growth of FemTech in India over the past seven years, marked by over 40 successful funding deals totaling $98 million [28]. Yet, FemTech's private sector digital health interventions remain understudied in HCI scholarship.

In the healthcare context of emerging economies like India, scholars in Human-Computer Interaction (HCI) and Computer-Supported Cooperative Work (CSCW) have explored the challenges with and opportunities for integrating interventions for maternal healthcare [6, 7, 49, 64, 85, 99, 104] and menstrual hygiene management [15, 36, 63, 93, 94] within strained healthcare infrastructures. However, these studies have typically focused on interventions sponsored by government or non-governmental organizations or non-profit interventions devised by researchers themselves. Furthermore, these studies have not researched health concerns that are chronic illnesses requiring long-term treatment where the scalability and quality of healthcare delivery operations is essential for health management.

In this paper, we research the design, operations, and sustainability of commercial, for-profit, FemTech platforms treating long-term SRH disorders, such as PCOS in India. Of particular interest to us is the centering of 'care' by FemTech platforms for PCOS – henceforth referred to as PCOS platforms – that are start-ups incubated with venture capital funding. On their websites, apps, and social media channels, PCOS platforms describe themselves variously as 'new frontiers of healthcare,' 'online/digital health clinics,' 'comprehensive care platform,' or 'a complete ecosystem for women's health.' They assert their commitment to PCOS care through 'care packages' or 'care programs' that they describe as being non-judgmental, accessible, and personalized to patients' needs. Aligning with calls to contextualize healthcare interventions for women within broader social, cultural, and economic frameworks [45, 50, 51, 88], we scrutinize the rhetoric and practice of care operationalized by PCOS platforms in shaping their services and business.

In contrast to the conventional devaluation of care work as an inherently feminine quality with minimal acknowledgment and

compensation [30, 38, 91, 97], PCOS platforms advertise their treatments as artfully designed 'care' solutions that are backed by data and science. With their insistent centering of care, PCOS platforms elevate and exalt care into a commodity that can be efficiently traded on the market to attract venture capital funding and support female wellbeing. We, therefore, examine the implications of FemTech platforms digitally centering care in the context of a stigmatized SRH condition like PCOS that is a popular condition addressed by FemTech platforms [5].

Care ethics scholars argue that market forces prioritize independent consumer choice for their care needs and diverge from care's fundamental principles of universal care arising from an interdependence and shared responsibility between citizens and the governments [62, 92]. These critiques emphasize the importance of treating care as a public sphere concern rather than relegating it to the private spheres of markets or homes, which could potentially burden consumers with the responsibility for their own care needs [92]. In light of these critiques, the claims to care by private FemTech start-ups gain significance as FemTech aligns itself with feminist ideologies [107].

To scrutinize the digital care assertions of platforms, we examine PCOS care in both traditional gynaecological healthcare infrastructures and FemTech platforms by drawing on Mol's logic of care [62]. Mol's study focused on diabetes management in Dutch hospitals, emphasizing the feasibility of sustained interactions between patients and healthcare providers, resulting in a "logic of care" that requires ongoing engagement between caregivers and care receivers. She highlighted the incompatibility of market solutions operating on a one-time transaction model with chronic health conditions, as this model reduces care to a set of choices offered and utilized independently by customers.

While Mol distinguishes between the logics of care and choice, she acknowledges that the organizational contexts governing patient-doctor interactions can vary, which is also reflected in other studies highlighting the cultural situatedness of care [e.g. [13]]. In India, despite the growth of the FemTech space, offline gynaecological healthcare systems remain overburdened [75] and stigmatized for SRH conditions like PCOS [74]. This prompts an exploration of how logics of care might shift between offline gynaecological and online FemTech infrastructures. We found that while the former emphasizes patient-doctor relations around maternal and child health, the FemTech market establishes an online platform-customer relationship to address stigmatized SRH conditions that receive inadequate attention offline. Mol argues that a quest for logic is a pursuit to uncover the style of doing things; exploring the coherent rationality embedded in infrastructure, technology, practices, and routines. In this paper, we seek to unpack a FemTech logic of care to understand its processes and operations in the context of an overburdened offline healthcare system. We therefore ask what constitutes care and how FemTech start-ups achieve it – in other words, what is a FemTech logic of care?

From an 18-month-long ethnographic study encompassing observations of offline gynaecological infrastructures and interviews with gynaecologists, platform founders, care managers, and individuals with PCOS, this paper addresses two key questions:

(1) How is PCOS care interpreted and implemented in offline gynaecological healthcare infrastructures in India?
(2) How is PCOS care interpreted and implemented in FemTech platforms in India?

Building on Mol's framework that distinguishes between logics for market and care, we uncover the tensions and co-existence of these logics in how FemTech start-ups design and operate care delivery. We contribute to CHI and CSCW discourse on the future of care and women's health interventions in two ways. First, we illustrate how technology start-ups digitally center PCOS care by reconfiguring offline deficiencies of fragmented, discontinuous care due to limitations in space, time, and human infrastructures into a data-driven, online experience moderated and coordinated by women professionals acting as 'care managers.' Second, we articulate a FemTech logic of care, emphasizing the interdependence and tension between the sustainability and inclusivity of its care logic and its scalability. We present recommendations for healthcare policymakers and FemTech platform founders to build sustainable and inclusive offline and online healthcare infrastructures.

2 STUDY CONTEXT

In this paper, we draw from various disciplines, including HCI, STS, and anthropology, where the terminology for AFAB people may vary. We maintain the terminology used by the authors while discussing their work.

2.1 Gynaecological Care and PCOS in India

Chronicling the histories of women's health and technology, Keyes et al. [45] note the dominance of Western feminist narratives over non-Western feminist histories. We situate our study by historicizing the discourse of women's healthcare in India to acknowledge the social, cultural, and political contexts when designing for women's bodies [51].

The establishment of gynaecology in India dates back to the late 19th century, when during British colonial rule, the life expectancy rate for Indian women was only 32 years owing to high maternal mortality rates and social barriers to healthcare access [78]. Simultaneously, the field of gynaecology globally started to establish itself to address the under-representation of women's interests in medicine. In response to widespread anemia, tuberculosis, and malnutrition, Queen Victoria sent newly trained gynaecologists from Britain to care for Indian women [78].

As medical colleges were established in India and barriers for women pursuing careers in medicine dissolved, attention to women's healthcare and the presence of women doctors increased. However, maternal and child mortality rates remained concerning. In response, Rajkumari Amrit Kaur, an influential woman and independent India's first health minister, initiated the 'family planning' national program in 1952 to specifically address women's health. Saraiya notes that while this move increased attention to women's health in newly independent India, it was also subsumed under broader concerns of family and the nation's welfare, reflected in slogans like "Women's Health – Nation's Wealth" and "Healthy Mother – Healthy Family" [78], perhaps reflecting that they were often tied more to population control than to women's well-being.

The historical legacies of prioritizing maternal and child health and linking them to the welfare of the family and nation continue to shape the stigmatization and treatment of SRH conditions such as PCOS. In a study on Indian women with PCOS, Pathak argues that bodies reflect the social and material conditions they inhabit and associates the increasing incidence of PCOS with India's economic liberalization in 1991 [72]. The economic shift propelled India's middle-class women into white-collar jobs, impacting their nutrition habits and circadian rhythms towards calorie-rich diets and sedentary lifestyles. Pathak reports that PCOS mismanagement arises from factors including women disregarding their own dietary preferences, trust deficits in patient-doctor communication, and a lack of consensus among doctors on PCOS treatment.

Buddhavarapu notes that studying PCOS reveals a network of discourses around the "new Indian woman" that is steeped in the anxieties of globalization and Hindu nationalism [17]. Since PCOS symptoms manifest as hirsutism (thick facial hair growth), balding, obesity, and irregular menstrual cycles, it is seen as a masculinization of women's bodies that threatens their chances of conceiving and the functioning of the family and children because of an urban lifestyle modeled on Western notions of modernity [17, 82]. Buddhavarapu [17] highlights that while early research on PCOS suggests that the condition may be caused by genetic and environmental factors [9, 26], attributing PCOS to diet and exercise—considered 'learned behaviors'—implies the patient's complicity in being responsible for her own condition, which influences how both people and doctors perceive PCOS.

2.2 Cosmetic and Fertility Solutions to PCOS Concerns

Kitzinger and Willmott [47] characterize PCOS as the 'thief of womanhood.' Unsurprisingly, in India, the beauty, wellness, and fitness sectors consistently target women with PCOS, offering solutions for cosmetic, weight, and fertility concerns through packaged services. These packages, influenced by the cosmetic and weight management industry, typically focus on skin care (e.g., skin brightening, acne scar reduction) and weight reduction programs. Additionally, they incorporate elements from ancient Indian medical systems like Ayurveda, Yoga, Naturopathy, Unani, Siddha, and Homeopathy (collectively known as AYUSH by the Indian government), providing suggestions for fertility issues.

Nationwide chains like VLCC (Vandana Luthra Curls and Curves) offer a 'PCOS wellness plan' that integrates dermatologists, dieticians, and fitness experts to address weight and skin concerns through lifestyle changes and technology-based therapies including vacuum suction for fat breakdown and LED therapies for skin treatment [60]. Notably, VLCC positions its PCOS plans as empowering women in exercising their right to motherhood. Similarly, e-commerce platforms abound with tablets and remedies from traditional medicinal systems like AYUSH, aiming to alleviate menstrual disorders and enhance conception possibilities affected by PCOS.

In the digital space too, popular fitness platforms like HealthifyMe and Cult, promote curated PCOS programs. While HealthifyMe distinguishes its PCOS plans from regular weight loss programs by integrating calorie tracking and doctor consultations, Cult offers customized yoga sessions for PCOS by incorporating pelvic floor muscle and breathing exercises to address menstrual irregularity and stress, commonly observed PCOS symptoms [29].

We observe the emergence of FemTech platforms catering to PCOS care against this background of cosmetics, weight loss procedures, and fertility being the primary concerns for PCOS. We remain attentive to Mol's observation that technologies can alter both the practical as well as moral frameworks of our existence [62]. In striving to locate a FemTech logic of care on PCOS platforms, we are thus alert to the potential entanglement of ideologies of heteronormativity, patriarchy, and nationalism with capitalist logics that shape the FemTech market's claim of responding to a stigmatized condition like PCOS.

3 RELATED WORK

3.1 FemTech in HCI

Throughout history, science and technology have predominantly focused on a male perspective, marginalizing women's health concerns. The term FemTech, coined by Ida Tin, was itself a bid to raise awareness around women's health issues since entrepreneurial initiatives in women's health have historically faced resistance and lacked funding due to social stigma [107]. In HCI scholarship too, attention to women's health is relatively recent, with efforts to challenge normative ideas about women's bodies [45]. Scholars note HCI's historical reluctance, attributing it to taboos surrounding women's intimate body parts and the political implications associated with women's health [2, 45, 67].

Overcoming initial funding resistance, the current global growth of FemTech services and products underscores the commercial viability of ventures addressing unmet women's health needs outside clinical settings and favoring the privacy of homes. While feminist scholarship raises concerns about inclusion, privacy, and surveillance associated with these technologies, optimistic perspectives highlight FemTech's role in promoting self-care, offering alternative approaches to managing health conditions, expanding inclusion to previously underserved conditions and populations, and fostering positive changes in patient-doctor interactions [2]. FemTech has thus also been described as an emerging women's health movement that addresses the shortcomings of traditional healthcare systems [107].

Despite its origins as a women's health movement, FemTech projects face criticism for constraining or contradicting feminist ideologies of women's empowerment [61, 67, 95]. Ng et al., for example, highlight a women's healthcare start-up in Taiwan that successfully challenged regulatory restrictions on menstrual cups [67]. However, the start-up ultimately reproduced traditional power structures that undermined, instead of strengthening, women's right to choose their healthcare options.

In the Indian and larger Global South contexts, HCI and CSCW scholars have interrogated and designed for multiple facets of infrastructural breakdowns in public health systems for women. Their studies have addressed maternal and menstrual healthcare in low-resource settings led by NGOs, the government, or the researchers themselves aiming to tackle understaffed healthcare systems. Examples include studying WhatsApp and chatbot-based information and support seeking among rural women for antenatal and postnatal care [40, 42, 104, 105], interventions to support the critical

labor of community health workers for women's healthcare needs [49, 103, 106], designing culturally sensitive interventions for pregnancy care [6, 7, 64, 85, 99], and initiatives destigmatizing practices around menstrual hygiene management [15, 36, 63, 93, 94]. However, less represented in this literature are commercial FemTech ventures in emerging economies like India where the distribution of healthcare services is already fragmented and marginalizes SRH conditions [46] and queer communities across gender identities and sexual minority identities [102].

3.2 Beyond FemTech Tracking and Control

HCI and CSCW literature studying commercial FemTech platforms in developed economies like the US and the UK have primarily focused on menstrual health, fertility tracking, and pregnancy tracking technologies, available as mobile applications and IoT devices [3, 27, 32, 58] that comprise one-third share of the global FemTech market [54], highlighting concerns with data surveillance and lack of queer inclusion. Other research on tracking applications for PCOS [20] and endometriosis [57] recommends customization to track different symptoms associated with these conditions. Studies on market-driven FemTech innovations in India too have focused on menstrual and fertility tracking applications and express concerns with their data surveillance, privacy, and regurgitation of social norms and taboos, reducing women's health to their biological reproductive functions [61, 95].

We observe that attention towards commercial FemTech ventures is limited to fertility and menstrual health tracking applications. Philosophically, these FemTech innovations center on the idea of asserting control over the leaky, ever-changing, and unruly body through self-produced quantified data, increasing self-knowledge and optimizing for self-control [21, 31, 32, 66, 100]. However, the FemTech market has expanded to offer solutions for various chronic, enigmatic, and stigmatized SRH concerns, including PCOS. Despite the global and Indian growth of FemTech innovations addressing chronic lifestyle conditions and sexual health, there is a notable lack of FemTech scholarship on themes other than asserting quantified self-tracking control over the body.

In this paper, we depart from the predominant focus on FemTech technologies offering control over the body to spotlight Indian FemTech platforms centering care for SRH conditions like PCOS.

3.3 HCI and Care

HCI and CSCW scholarship contribute considerably to studying technology's role in supporting care infrastructures that are often overburdened and lack investment [39, 89]. Within developed economies, scholars have revealed different forms of infrastructuring work that formal and informal caregivers engage in to better care for patients and themselves while delivering care virtually [19, 44, 48, 79, 84].

In emerging economies, care has been studied in the context of caregiving duties by marginalized healthcare workers. For instance, women from low-income households, working as community health workers (CHWs), constitute the main human infrastructure of care in rural India [33]. They invite attention to the invisibility of CHW care labor with the top-down integration of digital health applications like health data management [97], AI-based healthcare tools [34, 68], and digital payment methods [38]. Meena SP et al. argue that the standardization of care work through health data collection applications in India, obscures the additional labor women frontline health workers perform beyond their daily duties of visiting and counseling patients at their home under the state's rhetoric of 'caring' for its citizens [83].

As a response to this devaluation of care work, scholars have shared alternate perspectives towards care that view it not just as a form of work, but also as a resource to resist exploitative systems. Toombs et al. urged the HCI community to engage with care as a design lens to support interpersonal care and interdependencies amongst caregivers, care receivers, and their political contexts [90]. Scholars have also unpacked the role of care as a form of resistance towards power structures that devalue their labor along the lines of caste and gender even as they navigate digitization and social and economic precarity [35].

As care moves from physical clinic spaces to remote monitoring and teleconsultations accelerated by the COVID-19 pandemic [56, 80], Bhat et al. [12] urge the HCI and CSCW community to attend to the labor and work routines of care workers that shift with the integration of technology in health to avoid the invisibilization of their care labor. This is especially significant as telemedicine is considered an inferior alternative to in-person consultations that are usually inaccessible in low-resource settings, which might render the teleconsultation labor invisible [14].

We contribute to care inquiries in HCI and CSCW by tracing how care changes when it moves from offline gynaecological healthcare infrastructures to the realm of the FemTech market that is explicitly foregrounding and commodifying care as its core offering. This is additionally significant in a context like India, where a majority of healthcare inquiries in HCI have focused on state-supported digital health infrastructures, despite the increasing market share of private digital healthcare offerings [16].

Puig de la Bellacasa [23], extends Latour's matters of concern [53] to argue that unlike 'concern' which may limit itself to mere thinking, 'care' requires taking responsibility and acting in response to a need. PCOS platforms' insistent centering of care motivates us to identify FemTech logics of care that are responding to the needs of a stigmatized condition like PCOS, which remain unmet in offline gynaecological infrastructures.

4 METHOD

4.1 Data Collection

The data collection for this study spanned 18 months, from January 2022 to June 2023. We conducted this study both in Bangalore and online. Ethics approval was obtained through the IRB process of IIIT Bangalore. We conducted in-depth semi-structured interviews with gynaecologists, platform founders, platform care managers, and individuals diagnosed with PCOS. Additionally, we observed the infrastructural setup of gynaecological outpatient departments in offline healthcare systems, such as public and private hospitals and clinics, to compare PCOS care practices in both offline gynaecological infrastructures and PCOS platforms. Below, we outline the data collection conducted and the associated participants' sampling in these two settings: PCOS platforms and offline gynaecological infrastructures.

4.1.1 PCOS Platforms. We initiated our research by engaging in informal conversations with PCOS patients in our networks to gain insights into their management experiences. Concurrently, we observed the increasing prominence of FemTech in the media, particularly through Instagram influencers in women's health and body positivity, such as @dr_cuterus (Dr. Tanaya Narendra) and @alwaysalittleextra (Diksha Singhi), who post on various topics, including PCOS. Sponsored ads on our Instagram feed from FemTech platforms promoting PCOS care solutions also introduced us to multiple PCOS platforms. Consequently, we delved into studying the design and delivery of care by these PCOS platforms to understand their solutions, given the lack of literature on them.

We identified 11 platforms positioning themselves as 'women's health platforms' providing PCOS plans through our Instagram feeds and an Indian women's health technology market research platform [43]. We first reached out to the founder of one such Bangalore-based platform, where we live. The founder permitted the first author to conduct a two-month observational study at their office after signing a non-disclosure agreement to ensure the confidentiality and anonymity of the platform's operations. Interviews with the founder and employees of the platform, coupled with observations of the platform's operations, contributed to a preliminary understanding of how market and user research shape the design and operations of PCOS programs.

We then reached out to platforms located in cities other than Bangalore for geographic diversity in our sample that would allow us to understand the platforms' reach in different parts of the country. Founders of five platforms responded favorably to our interview requests. Our fieldwork with the first platform contributed to establishing our research credibility and interest in PCOS. Our final sample comprised six platforms based in four different tier-1 Indian cities - Mumbai, Pune, Bangalore, and Chennai - renowned as technology and start-up hubs. One platform was incubated at a top-ranked engineering school while another operated in a 'phygital' manner, providing online and offline consultancy and diagnostic services addressing various SRH concerns including PCOS. The platforms were one to three years into their operations and their funding phases ranged from pre-seed to Series A.

During the course of fieldwork, one platform ceased operations due to funding constraints after two years and another platform was acquired by a digital health start-up. In contrast, the 'phygital' platform expanded to three offline clinics in three years. These diverse outcomes of platform growth added valuable dimensions towards understanding the dynamics of the PCOS platform landscape.

None of the six founders we interviewed held any kind of healthcare degrees; rather, their training and education belonged to the engineering, management, and public policy domains. All platforms were founded or co-founded by AFAB women. Two had personal experience with PCOS and one had experienced multiple SRH concerns. Additionally, all founding teams had a member with PCOS or SRH concerns. Founders (F#) were in the age range of 25-35. Our sample thus comprised individuals with diverse backgrounds and personal connections to the SRH issues addressed by the platforms. Founder details are detailed in Table 1.

In line with the ethnographic principles of theoretical sampling and an emergent research design [22], we strategically focused on 'care' in response to its recurrent emphasis by the platforms under study. During interviews, we remained attentive to how founders used the term 'care' and probed further with questions such as, 'What does 'care' mean for your platform?,' 'How is 'care' manifested in your service delivery?,' and 'What metrics do investors prioritize to sustain funding support?'.

Using purposive [11] and snowball sampling [70], we recruited 19 customers (C#) at various stages of engagement with PCOS care plans on different platforms. This spectrum included beginners and those considering plan renewal. Interviews were conducted with customers from three of the six platforms. Customer demographic details are provided in Table 2.

For the remaining three platforms, insights were primarily drawn from founder interviews to examine care operations. Questions posed to platform customers centered around their perceptions of the presence or lack of care in their PCOS management and differences they found between platforms' and offline gynaecological consultations.

We also discovered a new professional category of 'care managers' (CM#) on platforms, who were all AFAB women and held degrees in nutrition, commerce, and STEM fields. We interviewed four care managers to understand their everyday responsibilities in translating the platform's care rhetoric into practice and describe their details in Table 3.

We also interviewed two female gynaecologists (G#, age range 35-45), consulting at private hospitals and clinics as well as platforms on their perceived differences in offline and FemTech consultations.

4.1.2 Offline Healthcare Infrastructures. Since all our interviews repeatedly referenced the deficiencies of offline PCOS gynaecological care, we expanded our field of inquiry to offline gynaecologists in Bangalore to understand their perspectives towards PCOS management.

We interviewed 11 offline gynaecologists (G#)—two male and nine female—via in-person interviews. Three doctors practiced in private clinics, four in corporate and public hospitals each, and one general practitioner in a peri-urban health center. To diversify our sample, we consulted a crowdsourced list featuring gynaecologist consultation reviews from mainly sexually active and unmarried, straight and queer individuals. This helped us contact gynaecologists across Bangalore in different age groups, resulting in interviews with 11 gynaecologists who responded to our requests. Their details are described in Table 4.

During interviews with gynaecologists in hospitals and clinics, we observed spatial layouts, waiting area information, patient wait times, and doctor-patient consultation duration. We introduced ourselves and our study to patients in waiting areas and interviewed seven patients who were willing to interact with us. Two of these patients revealed they had PCOS. Additionally, we circulated calls on social media and employed snowball sampling to recruit 10 participants (P#) with PCOS who had consulted with offline gynaecologists. We describe these 17 patients as P# marking their difference from platform customers C#. Their demographics are detailed in Table 5.

4.2 Data Analysis

The collected data encompassed field notes, audio recordings of interviews when permitted, and handwritten notes. Interviews at

Table 1: FemTech Platforms and Founders

Founder	Gender	Age	Degree	Location	Operational experience	Funding Stage
F1	Woman	In her 30s	MBA	Bangalore	3 years	Series A
F2	Woman	In her 30s	M.Phil.	Mumbai	1 year	Seed
F3	Man	In his 20s	B.Com.	Chennai	1 year	Pre-seed
F4	Man	In his 30s	M.Tech.	Bangalore	2 years [Stopped Operations]	Seed
F5	Woman	In her 30s	Masters in Public Policy	Bangalore	2 years [Stopped Operations]	Seed
F6	Woman	In her 20s	B.Tech.	Pune	1 year [Acquired by a digital health start-up]	Pre-seed

Table 2: Platform Customers

Platform	Platform Location	Funding Stage	Interviews	Age	Gender/ Sexual Orientation	Participants' Location	Marital Status
PT 1	Bangalore	Series A	5	24-28	Cis-het (3) Non-binary (1) Cis Queer (1)	Bangalore, Kolkata, Hyderabad	All unmarried
PT2	Bangalore	Seed	7	21-31	Cis-het (7)	Hyderabad, Pune, Kolkata, Mangalore, Gurugram, Chandigarh	Married (4)
PT3	Mumbai	Seed	7	19-28	Cis-het (6) Cis Queer (1)	Bangalore, Bhilai, Delhi, Bhopal, Chandigarh, Bahadurgarh	All unmarried

Table 3: Care Managers

Care Manager	Degree	Primary job profile
CM1	B.Tech. (Biotechnology)	Operations Manager
CM2	M.Sc. (Mathematics)	Sales Associate
CM3	M.Sc. (Nutrition and Dietetics)	Nutritionist
CM4	MBA	Sales Associate

government hospitals were conducted in Hindi, which is the first author's native language, or in Kannada with translator assistance. All other interviews were in English. Interviews were transcribed and both authors reviewed and discussed them to identify emerging lines of inquiry. The recurrent use of the term 'care' on PCOS platforms led us to compare the vocabulary of care across participants with Mol's care logic, distinguishing patient-doctor and market-customer interactions, guiding our data analysis.

As fieldwork concluded, the first author utilized open coding [22] to explore care interpretations and practices in diverse offline and FemTech infrastructures. Iterative open coding on interview transcripts and observational field notes produced codes such as "vocabulary of gynaecological care" and "infrastructural challenges in PCOS care delivery." Similarly, understanding platform-driven PCOS care involved open coding on founder, customer, and care manager interviews. Emerging axial codes included "platforms highlighting deficiencies in offline infrastructures through PCOS care" and "care managers' responsibilities in customer engagement." Both authors analyzed all codes and developed categories like "offline conditions of PCOS care" and "centering of PCOS and care in the FemTech space."

Table 4: Offline Gynaecologists

Medical Setup	Observations	Interviews	Age Range	FemTech Awareness
Public Hospitals	3	4	30-40 (1) 40-50 (3)	No
Corporate Hospitals	6	4	30-40 (1) 40-50 (2) 50-60 (1)	No
Private Clinics	4	3	30-40 (1) 40-50 (1) 50-60 (1)	Yes
Primary Health Center	1	1 (General Practitioner)	30-40	No

Table 5: Offline Patients

Setting	Interviews	Age Range	Gender/ Sexual Orientation	Location	Marital Status	Participants with PCOS
Public Hospitals	5	23-28	Cis-het (5)	Bangalore	Married (5)	1
Corporate Hospitals	2	34, 43	Cis-het (2)	Bangalore	Married (2)	1
Recruited Online	10	20-33	Cis-Queer (7) Trans masculine Queer (1) Cis-het (2)	Bangalore, Pune, Mumbai, Kolkata, Gurugram, Ahmedabad	All unmarried	10

4.3 Positionality and Ethical Considerations

Both authors, AFAB cis-het Indian women, have navigated offline gynaecological infrastructures and encountered varying levels of neglect for their health concerns. We also visited the phygital platform's clinic for consultations and doctors were informed of our FemTech research interests during these visits. The first author shared her gynaecological experiences during PCOS participant recruitment and interviews, fostering rapport with participants.

Interviews were conducted in-person or online using Zoom based on participant location and preference. We described our study and presented sample questions at the start, seeking participants' consent for the interviews. Icebreaking conversations around waiting times and gynaecological history facilitated hospital-patient discussions. We recognized the inherent power difference between researchers and participants [55], especially with low-income patients in public hospitals, and avoided sensitive questions on their gynaecological health, instead focusing on their experiences with gynaecologists. Participants' identifying data and institutions were anonymized. While founders and care managers were assured confidentiality, they may have shared partial operational details and motivations with us to safeguard their operational details.

We align with non-essentialist gender identity and sexual orientation views and describe participants with their self-reported identity during our interactions.

5 FINDINGS

In this section, we first outline the typical process of a PCOS care program to contextualize the rest of the findings. We then explore how PCOS is treated offline to situate FemTech claims of providing optimal PCOS care. Next, we discuss motivations for founding PCOS platforms, their rationale for centering care, and operational care delivery practices.

5.1 Functioning of PCOS platforms

Combining insights from founders', care managers', and platform customers' interviews across the six platforms we studied, this overview highlights commonalities in the operations of PCOS platforms and their care programs.

All platforms provide users an interface through their websites and mobile apps. Customers engage by either logging into a customer dashboard on the website or downloading the app, available for both Android and iPhone users. The duration of PCOS care packages varies from three months to a year, with costs ranging

between $18 to $36 (1500-3000 INR) per month. Active social media presence, particularly on Instagram, is a common strategy for platforms where they share content on PCOS and SRH issues, aiming to raise awareness and drive traffic to their website and app.

To encourage enrollment, platforms offer introductory discounts, ranging from 10-40% as well as EMI payment options on PCOS plans. Customers purchase plans upfront using various digital payment options. The subscription typically includes consultations with gynaecologists, nutritionists, and access to physical workout sessions. Optional add-on consultations with dermatologists and therapists are available at additional costs, ranging from $6 to $18 (500 INR – 1500 INR). The central point of contact for customers is the 'care manager,' responsible for coordinating the PCOS management plan among different healthcare experts and the customer.

If a potential customer suspects PCOS but has not been clinically diagnosed, they may first undergo bloodwork and other diagnostic tests to assess health parameters. Platforms collaborate with diagnostic labs, providing home collection services for test samples. If the results indicate PCOS, the customer is encouraged to purchase a subscription for a care plan.

Upon subscription, the customer receives an onboarding call from a care manager who explains the platform's processes, such as navigating the app, booking consultations, and accessing fitness sessions. The customer is then scheduled for video calls with a gynaecologist and nutritionist separately, each lasting about 20 minutes, for a detailed case history and dietary advice. The care manager remains available during working hours for feedback or questions through text messaging on WhatsApp or the platform's app.

5.2 The Offline Conditions of PCOS Care

Despite the presence of PCOS platforms, all PCOS participants initially sought support from offline gynaecological systems, turning to online options only if they were unsuccessful in receiving satisfactory treatment from offline systems. Platform founders too cited deficiencies in offline systems as a motivation for creating digital PCOS care solutions. In this section, we report findings based on interview data of gynaecologists and participants with PCOS.

5.2.1 On the fringes of 'Ob/Gyn'. Although gynaecology focuses on the female reproductive system, we found its practice heavily skewed towards obstetrics, a sub-specialization centered on pregnancy and childbirth. Often paired as Ob/Gyn, obstetrics dominates gynaecological attention, evident in corporate hospital chains and private clinics where pregnancy-related information and aesthetics dominate. A private hospital we visited even housed its gynaecology department in a separate building named 'Maa' (mother in several Indian languages). This emphasis on pregnancy and childbirth is influenced by both social and financial considerations.

Gynaecologists in public hospitals explained the dominance of obstetrics due to government priorities aimed at monitoring and reducing maternal and child mortality rates [10]. Additionally, they shared that around 70% of daily patients in public hospitals have pregnancy-related concerns. G7, a male urogynaecologist, cited his unsuccessful attempts in establishing a urogynaecology department in a public hospital due to the government's focus on obstetrics care.

For gynaecologists practicing independently, attention to pregnancy is driven by expectant mothers requiring regular check-ups and follow-ups for subsequent pregnancies. Hence, they cultivate long-term relationships with women, considering them a reliable income stream. Similarly, G10, a gynaecologist with a private hospital, revealed that hospitals set monthly revenue targets, with deliveries playing a significant role in meeting these targets.

Although untreated PCOS increases risks of hypertension, diabetes, and endometrial cancer, complications associated with PCOS receive minimal attention from doctors, with gynaecologists stating that unless PCOS symptoms hinder conception, there is no role for medical intervention. G9, a 45-year-old gynaecologist at a maternity care hospital, echoed this perspective.

> *"Until you want to conceive, PCOS is your headache. You have to make the lifestyle changes to resolve it. When you are unable to conceive, only then doctors have something to treat."*

Consistent with other studies [71], our PCOS participants also reported feeling alienated as gynaecologists counseled them mainly through the lens of biological reproduction, often suggesting that physical discomfort was an inherent part of women's lives. This alienation was heightened for queer-identifying patients. C13, a non-binary, 28-year-old said,

> *"I have experienced medical gaslighting multiple times and been recommended marriage to resolve PCOS. A gynaecologist performed the two-finger test on me to check my virginity due to irregularities in my menstrual cycle because she wanted to confirm if I was sexually active and pregnant. She lost interest when she realized I was not pregnant. To cope, I would access the masculine side of me... be a man... and not let PCOS bother me."*

Thus the gynaecological world's preoccupation with obstetrics marginalizes conditions like PCOS unless fertility treatment is required.

5.2.2 Fragmented, expensive, and discontinuous treatment. We observed that while PCOS required consistent long-term treatment from various health professionals, offline health infrastructures were fragmented, operating in separate clusters, thereby impeding patients' access to holistic treatment. PCOS participants noted that, besides gynaecologists, managing PCOS involved consulting multiple health professionals such as endocrinologists, dermatologists, nutritionists, and fitness instructors. However, gynaecologists often lacked PCOS-specific awareness about directing patients to relevant specialists.

Gynaecologists provided various reasons for not collaborating with other healthcare providers, including reluctance to increase patients' costs. In the private health sector, consultation fees range from $10-$18 (800-1500 INR). G11 estimated that accessing all services, including diagnostic tests like ultrasonography, bloodwork for androgens, and consultations with nutritionists and dermatologists, could raise the cost to $121 (10,000 INR). She said,

> *"I take it upon myself to give dietary advice, because if I send patients to a nutritionist, they will charge even more than me. Why spend so much money? Also, hospitals are extractive and need to meet revenue targets.*

> *If I prescribe tests and additional experts at one go, the cost might go up to Rs. 10,000 and the patient will discontinue treatment."*

Gynaecologists also cited their inability to identify reliable nutritionists and fitness experts that were equally accessible to patients. Due to the fragmented and costly nature of the treatment, patients experienced frequent interruptions in addressing PCOS symptoms. Engaging in trial and error solutions, many eventually gave up on treatment. C6, a platform customer, shared her challenging offline experience:

> *"My gynaecologist just asked me to lose weight. I have been alternating between taking pills and trying to lose weight just to get my periods back on track since the past 10 years and have been trying different workouts and diet plans that I find on the internet."*

Thus, patients expressed frustration, noting their inability to access timely and collaborative PCOS treatment in offline health infrastructures due to high costs and a lack of collaboration among various healthcare experts.

5.2.3 Deficiency of time and space shaping offline doctor-patient interactions. Time and space emerged as significant factors contributing to a fragmented and interrupted PCOS treatment. Across healthcare facilities, doctors grappled with high workloads. Private hospital gynaecologists attended to 20-30 patients daily, while public hospital doctors faced overwhelming numbers of 70-80 patients daily, spending only five to seven consultation minutes per patient.

Moreover, public hospitals operated under severe space constraints, with multiple doctors sharing a single room for consultations, leading to high noise levels, lack of privacy, and rushed consultations. We frequently witnessed heated arguments between patients and security staff over barring entry to companions due to limited space. G7, a gynaecologist at a public hospital said,

> *"We are frustrated with our workload due to the number of patients and are just looking to finish the consultations. These patients are poor and are not in a position to even protest about privacy or infrastructure. Their priority is to see a doctor."*

Although corporate hospitals had better infrastructure and privacy for doctor-patient interactions, workload concerns persisted. G11, who practiced in her own clinic instead of consulting with corporate hospitals said,

> *"I own my practice so I can spend more time with the patients. Corporate hospitals call me to consult with them but I refuse. They will pressurize me to finish consultations with 15 patients in two hours, which I am not comfortable doing."*

Doctors revealed that their intense workload and lack of counseling skills limited their involvement with PCOS patients. Managing PCOS is a long-term process requiring lifestyle changes in diet, fitness, and sleep patterns with regular follow-ups to monitor patient progress. While gynaecologists typically recommend a follow-up every three months, patients often feel demotivated and do not return. G8, a gynaecologist at a public hospital shared,

> *"We can be empathetic if we have the time. We know exercising is challenging, but do not have the time to know PCOS patients and personalize treatment. They stop coming for follow-ups as they make no progress on weight loss."*

We found that deficiencies in time, space, and counseling style in offline gynaecological care pose challenges to PCOS treatment. Sustained patient-doctor interactions, integral to the care process [62], are hindered by these infrastructural constraints.

5.2.4 The vocabulary of 'care' in gynaecological practice. The term 'care' in PCOS programs on FemTech platforms prompted an exploration of how gynaecologists unaffiliated with these platforms interpret and use the concept of 'care.' Interestingly, aside from the commonly used term 'healthcare,' gynaecologists did not frequently employ 'care' to describe their practices and patient interactions. Instead, terms such as 'treatment', 'advice', 'suggestion', and 'counseling' were more prevalent in their vocabulary when articulating their treatment philosophies.

In line with Mol's observation of care being situated in doctor-patient interactions, participating doctors rejected the need to explicitly define 'care' in their practice. They viewed care as an intrinsic part of routine interactions that could not be formalized into a rigid protocol [62]. When asked to elaborate on what constituted 'care,' doctors cited examples, including acts of generosity towards economically disadvantaged patients, counseling cis-het couples facing fertility issues, and maintaining connections with women whose babies they delivered. G6, a 60-year-old gynaecologist with her own practice, mentioned,

> *"Care is a lot of things beyond treatment. I counsel patients' families, understand their finances so that they can afford treatment. I also treat slum dwellers for free and customize my consultation charges depending on their financial situation, so I care for them in financial ways."*

G7, working in a public hospital, emphasized a distinction between 'basic' care and the 'quality' of care. He stated that their primary focus was ensuring a safe pregnancy and childbirth. According to him, discussions about the quality of caregiving could only be meaningful once the fundamental task of saving lives was addressed. He said:

> *"We are a developing country, so, the focus is on lowering mortality rates of mother and child. We are overwhelmed in ensuring this itself. Once this is done, economy improves, then we can focus on quality care, and supporting women through other menstrual health phases. So, monitoring the quality of care will happen in due course, in the future."*

Interestingly, the Ministry of Health and Family Welfare, Government of India, introduced the LaQshya (Labour room and Quality Improvement Initiative) guidelines in 2017, aiming to decrease mortality rates during childbirth and prevent verbal and physical abuse of women by healthcare staff during labor. In interviews, doctors also referenced the LaQshya guidelines as an example of 'care,' emphasizing respect, privacy, and empathy in patient interactions. G8, serving at a public hospital, shared,

> *"LaQshya is to ensure that quality of care towards women in labor is equivalent to that in corporate hospitals and*

> *even abroad, where doctor-patient interactions are more regulated. Care is ensuring that respect, privacy, and empathy is provided to them by the staff and they are allowed to have a companion with them."*

Other than LaQshya we did not find doctors directly invoking 'care' to describe their practice and interactions with patients.

5.3 The Online Centering of PCOS and Care

5.3.1 Driven by Market Research. In offline healthcare settings, gynaecologists are the primary contacts for PCOS participants, but on PCOS platforms, a diverse range of professionals contribute to patients' experiences. Founders of these platforms were from engineering, management, and public policy backgrounds and two had graduated from top-ranking US universities. Additionally, some founders had prior professional experience in the healthcare sector, working in roles such as policy consultants and marketers, while others were in business consultancy and software development before founding their platforms.

For founders, the motivation to start an online PCOS program often arose from personal experiences or from family and friends dealing with PCOS. These personal contexts, coupled with market research, indicated a viable market for digital PCOS solutions. All founders expressed the sentiment that "PCOS care systems are broken in India," with two explicitly using this phrase to describe issues such as a lack of collaboration between healthcare experts, limited consultation times, judgmental attitudes towards PCOS, and challenges in patient follow-ups. They believed that a digital platform could facilitate long-term coordination between healthcare professionals and women, a necessity for effective PCOS management. F3, a male founder, said,

> *"My co-founder and I spoke to 50 healthcare experts, including gynaecologists, nutritionists, and 100 PCOS patients. The system for PCOS care is dysfunctional... there is no infrastructure in hospitals for long-term care and different experts are unable to collaborate. We envision ourselves as changemakers for PCOS care with our platform."*

For F1, a female founder of the phygital SRH platform, her own uncomfortable experiences in offline gynaecological settings were pivotal for her FemTech initiative that sought to provide a premium aesthetic experience to AFAB people. She reflected,

> *"I had been to gynaecologists for multiple concerns and besides their dismissive behavior, I also had to experience horrible... dirty toilets in a hospital. Other women I know echoed similar experiences. This is basic healthcare, and someone like me who is well educated should not struggle to access quality care when I can easily afford to pay 1000 INR ($12.11) extra for the right doctors and good infrastructure. Why can't the interiors of a healthcare space be pretty? We spend so much for an experience at Starbucks and Zara, but where do we go for a premium quality healthcare experience?"*

Gynaecological indifference served as a personal trigger for all the women founders with PCOS to reconsider alternative approaches to PCOS management. They shared personal experiences of receiving unsuccessful short-term solutions, such as contraceptive pills to regulate menstrual cycles, instead of guidance on lifestyle changes. F6, a female founder and engineer in her mid-20s, shared:

> *"Gynaecologists were unhelpful. When I read books on PCOS, I realized lifestyle changes were the only solution. This is when I felt I could use my engineering skills to build a digital platform that would unite all healthcare professionals for PCOS in one place."*

Similarly, F3, a male founder, with a background in operations management and consultancy was motivated to explore digital PCOS solutions owing to friends and relatives managing PCOS. F2, a female founder, who did not have PCOS, drew on her background in health and public policy to understand gendered health challenges. She noted that women with PCOS often feel invalidated and fearful due to incorrect diagnoses:

> *"We receive queries from women with PCOS symptoms every day. They remain undiagnosed due to inconsistent diagnosis practices in India. I am unsure if conditions like PCOS and endometriosis are even taught holistically in gynaecology. We started as a mental health platform but realized the challenges in finding quality healthcare for PCOS, so we included a PCOS program, too."*

Founders also observed that awareness about PCOS risks beyond fertility challenges was limited. They reported that PCOS patients worried about symptoms only when it challenged their marriage and motherhood prospects although they were at heightened risk for other health issues. F3, recollected his experiences of conducting customer acquisition drives in Chennai in South India, where the onset of menarche is ritually celebrated to welcome a girl's fertility and marriageability,

> *"When we conduct awareness programs in educational institutions, mothers bring their daughters right before their marriage, requesting us to cure their PCOS so that it doesn't affect their chances of conceiving."*

Despite lacking formal healthcare training, founders were utilizing market and user research to identify challenges in PCOS treatment within offline gynaecology processes. They discovered that both gynaecological infrastructures and socio-cultural norms associated with the bodies of AFAB individuals were limiting factors in PCOS treatment.

5.3.2 Invoking 'Care' to treat PCOS. Unlike offline gynaecologists, founders frequently used the term 'care' in interviews. PCOS treatments were labeled as 'care packages,' and platforms described their medical and non-medical staff as a 'care team,' using phrases such as "we found a team that cares for you." Mol observes that uncertainty and failures are unavoidable characteristics of care [62]. Similarly, founders emphasized care towards PCOS rather than promising a cure or treatment, acknowledging the inherent unpredictability in managing a chronic and enigmatic condition like PCOS that can only be managed by building lifestyle habits such as mindful eating and consistent physical exercise. Given the long-term nature of these habits, caring is essential for managing PCOS symptoms.

F4, a male founder whose platform closed operations due to funding constraints, rationalized labeling their plans as 'care,'

> *"We were not a medical company or doctors. We didn't prescribe, but suggested lifestyle changes... that was care. We brought together all care angles - a team of healthcare experts like fitness trainers, nutritionists, who are dedicated to you getting better in the longer run."*

F2, with a degree in public policy, said that providing clarity for PCOS management itself was a form of care,

> *"Care is providing clarity. I cannot promise that our platform will cure PCOS forever. The research on PCOS is ongoing... we are aware of merely some pathways to manage it. Some provide false promises to monetize the reproduction linked vulnerabilities of women. However, the focus should be on long-term care."*

Mol emphasizes the importance of iterations in the logic of care to meet the customized needs of individuals. However, she also notes the significance for care institutions to establish a general set of principles about their care delivery practices. This approach limits the scope of failures that the logic of care may demand by providing care receivers with predefined principles. It holds institutions accountable and ensures the provision of some value to care receivers, balancing the trial-and-error nature of the care process.

Platforms inform customers about the variability of PCOS management progress depending on lifestyle factors and at best offer assurances of support towards symptom alleviation that were not formalized into metrics or principles for platform accountability towards customers. However, we observed that PCOS platforms did use care as a metric by linking it to measurable health outcomes to provide evidence to investors for funding decisions. F3, whose platform was in the pre-seed funding stage, shared:

> *"Investors seek several metrics including Google reviews of platforms to continue funding. However, the main metric is whether customers are seeing improvement in their symptoms. Are we delivering care to manage symptoms? This is an important indicator of our ability to scale."*

Lastly, care was also used as a marketing strategy to instil faith in customers. CM3, a nutritionist and care manager said,

> *"Using the term care is word play. It is a fancy, acceptable, and comforting word that FemTechs use to sound cool. The intent is to assure women that the platform will take care of them. Therefore, it is now a marketing strategy for all platforms."*

We also found platforms paying careful attention to language that went beyond the vocabulary of care in communicating with PCOS patients. Once diagnosed, PCOS did not require frequent physical examination or in-person visits to doctors and platforms leaned into language that would be considered empowering. For instance, echoing Mol's observation of markets treating people as 'customers' instead of 'patients,' we too found platforms privileging the use of 'customer' instead of 'patients' to avoid undesirable associations with illness [62]. C10, a 27-year-old shared that her PCOS platform always called her a 'customer':

> *"The platform was explicit about not treating us as patients as that is a negative term. They told us that we are not PCOS sufferers, but are customers of plans to improve the quality of our lives."*

Similarly, a woman founder with PCOS shared that their brand voice was to "never use the word 'never' while counseling women with PCOS." Instead, they used affirmative language such as, 'you will be able to get through this' or 'you are not alone,' which had to be depicted both through text and graphic illustrations on social media. Platforms treated their social media presence very seriously, both as a means to raise awareness about SRH conditions as well as a medium to generate sales.

Thus, unlike offline gynaecological infrastructures where attention to PCOS was marginal, FemTech platforms drew on user research to digitally center PCOS. They also artfully used language and 'care' to differentiate themselves from offline gynaecological settings.

5.3.3 Limited 'care' for queer concerns. However, platforms were limited in their efforts towards queer inclusion. Only one platform that operated phygitally was explicit about welcoming queer customers by purposefully signaling queer inclusion through pronoun use and asserting that they were non-judgmental about sexual and gender orientations in their advertising, social media posts, and the interiors of their offline clinics. In other platforms, we found occasional use of queer-inclusive language in social media posts that was not backed by a deliberate strategy.

CM3, a care manager and nutritionist with work experience across three PCOS platforms, shared that being queer-inclusive was equally a marketing and sales strategy that shaped her interactions with customers:

> *"Asking pronouns is not part of this platform's culture. Explicitly labeling the platform as queer-inclusive or not is the job of the marketing team. In the previous platform I used to ask pronouns, but here I am not required to."*

We also found that with the exception of the phygital platform, platforms felt unequipped to address queer concerns. F5 shared that as a new start-up dealing with a stigmatized SRH condition, their priority was to create awareness around PCOS, and they were currently unaware of queer concerns, which could be considered once their platform stabilized.

> *"We are unaware of channels to reach out to queer people. Safe spaces may be different for different people... our platform is probably not the right place to discuss queer concerns. As a small platform, our concern is to reach out to women."*

Queer PCOS participants too were largely unaware of the FemTech space and expressed skepticism that merely asking for pronoun choice signaled inclusion. C13, a non-binary PCOS platform customer, felt that pronoun choice was performative allyship limited to upper-middle-class digital spaces. C13 contrasted their platform experience with gynaecologists in their small city hometown:

> *"Doctors in my hometown never asked my pronouns the way this platform gynaecologist did. But this platform is run by extremely upper-class educated people... so, there are nuances of spaces, accessible to certain people.*

People in my hometown wouldn't be familiar with these practices."

Therefore, similar to offline gynaecological spaces, we found PCOS platforms too were limited in caring for queer people with PCOS.

5.4 Delivering PCOS Care Online

Recognizing the lacunae in doctor-patient interactions coupled with space and time constraints, platforms delivered PCOS care by strengthening human infrastructure, personalizing customer engagement through data and collaboration, and commodifying time and space as chargeable entities.

5.4.1 Training staff for PCOS care. Platforms employed varying numbers of staff, typically ranging from 10 to 20 members, depending on their size and funding phase with roles in engineering, product design, marketing, and sales. All employees participated in briefing sessions on SRH and PCOS to ensure a comprehensive understanding integral to their work. Platforms emphasized the importance of sensitizing their gynaecologists to adhere to diagnosis protocols and eliminate prejudiced behavior. For instance, F2, whose platform was a year old, outlined their gynaecologist training process:

"We train gynaecologists by showing them our research data. We conduct polls on Instagram and other surveys where women share that they feel judged and neglected in their interactions with gynaecologists. Our clinical supervisor uses those results to train our gynaecologists on how to take detailed medical history and avoid biased conversations around marriage and fertility."

Nevertheless, some gynaecologists were resistant to undergoing briefings by platforms. G3, a gynaecologist, perceived training as an implication that gynaecologists were inherently judgmental. She stated:

"Do you mean to say that all other gynaecologists are not doing their job properly and just the platforms ones are? The gynaecologists are already aware of how to be non-judgmental. You can't train them to be a certain way."

Platforms also encountered challenges in finding gynaecologists who aligned with the consulting cultures they sought to establish. Ensuring an unbiased doctor-patient interaction remained a priority and an ongoing effort at all platforms.

5.4.2 Configuring Space and Time for Gynaecologist-Patient Interactions. Along with training gynaecologists to avoid prejudiced interactions, resetting time and space constraints in offline doctor-patient interactions was crucial for platform operations. F1, a female founder of a phygital platform, likened care to uninterrupted time for doctor-patient interactions and a clean aesthetic experience in offline spaces. She charged consultation fees almost $4.82 (INR 400) above the market rate on her platform since the consultation times were longer. She reasoned:

"Care is when someone feels cared for. It is a lot more than just prescribing treatment. It means spending time with patients, listening to all their concerns. As opposed to a five-minute consultation that doctors provide, we have a 20-minute slot for every patient. We charge more but our slots are accordingly longer."

Platforms shared that while they paid gynaecologists their market rate, they trained, monitored, and evaluated their performance on the platform differently from hospitals. G10, a gynaecologist consulting with a FemTech platform shared that platforms use key performance indicators (KPIs) such as time spent with the customer and customer's evaluation of their interaction to evaluate gynaecologists in contrast to corporate hospital chains where gynaecologists' KPIs focused on facilitating successful pregnancies and childbirth.

Consultation time in hospitals was also often unpredictable and interrupted if a pregnant patient under their care went into labor. Acknowledging that she worked differently for platforms and a corporate hospital, G10, a 42-year-old gynaecologist said,

"Serving at the platform and at the hospital requires two different parts of my brain. In the platform, the setup is different, I have more time (20 minutes) to devote to the patient. The patient there is also expecting that quality of care. At the hospital, I am preoccupied either with supervising deliveries or thinking about them so I just wrap up the consult in 10 minutes."

Platform gynaecologists were also briefed to study patient test results and case histories before the consultation which shaped customer experience. C10 shared how her platform experience differed from offline consultations,

"It was the best experience I had. The doctor had seen my test reports before the call... she shared her computer screen to take me through the reports and calmly explained what the bloodwork and ultrasound scan indicated. It lasted for 45 minutes and was more communicative and explanatory than any other consultation I had."

Platform customers also expressed satisfaction with online consultations and support as it allowed them greater control over their schedule from the comfort of their homes to account for long and unpredictable waiting times or appointment cancellations.

5.4.3 Collaborating with customers for personalized care. Given the challenges in sustaining lifestyle changes, platforms pitched PCOS management as a shared and iterative responsibility between customers and healthcare experts. Since continued funding was only possible with positive customer testimonials, sustained customer interaction was vital to platforms.

For instance, nutritionists and care managers encouraged customers to share meal pictures on the app to facilitate timely feedback on portion sizes. Nutritionists sometimes shared their own meal pictures with customers if they missed hearing from them. C14 shared how her care manager's attention encouraged her to continue with the platform:

"I had only one video call with my care manager... rest were audio calls or texts on the app. Still, I always feel cared for by her. She pays attention to every detail of my meal pictures and suggests reducing meal portions gently. Due to this bond, I feel like I can cheat myself but not her."

Platforms' funding and customer acquisition were contingent on showing engagement and results with early customers. They, therefore, relied on tracking customer fitness and nutrition data to customize and support lifestyle changes. For instance, PCOS increases the risks of hypertension [59], limiting high-intensity workouts for weight loss. Therefore, platforms offered live and recorded fitness sessions in varying formats, including Yoga, Pilates, Cardio, and High-Intensity Interval Training. The options were appreciated by customers. C2, a 21-year-old with body image concerns, said:

> *"I tried different workouts and realized yoga worked best for my body. For the first time, I felt energized after the workout... trainer's individual attention helped us realize the importance of feeling energetic post-workout over only weight loss."*

Similarly, C19, who complained of fatigue owing to a long commute and working hours, appreciated the dynamic diet customization by her platform:

> *"My nutritionist changes the diet plan every three months based on my goals. For the first three months, it was weight loss. Now, my goal is to improve gut health and increase energy levels. This focus on holistic well-being is important because PCOS attacks different systems in a body."*

We noted that consistent iterations, coupled with clear guidelines on sustaining lifestyle changes, strengthened customers' trust in platforms. The availability of dedicated healthcare professionals for different lifestyle habits ensured continuity of care, and customers and care managers were invested in interactions even through phases of slow progress and aligned with Mol's observation of continuous and collaborative interaction being a key characteristic of care [62].

5.4.4 The Collaborative Care Work of Care Managers. Platforms could achieve collaborative interaction between customers and healthcare professionals because of the coordinating role performed by 'care managers,' an emerging professional role across all the platforms we studied.

Care managers were responsible for coordinating between healthcare professionals and customers. They were required to develop a clinical understanding of PCOS to simplify explanations to customers and act as boundary spanners between the healthcare professionals and customers [96]. Notably, this role shares similarities with the boundary work conducted by community health workers in India, mediating information between doctors and patients [33, 98].

Customers interacted the most with care managers, and often either nutritionists or operation managers would grow into these positions as they were already communicating frequently with customers. Describing her role, CM3, a 28-year-old care manager and nutritionist observed that care cannot be automated, and human attention was required to handhold customers throughout the program duration. CM1, another care manager, who was also managing operations, echoed her thoughts:

> *"This role is like nursing women to health. We handhold them throughout since it is easy to feel demotivated in an online mode, especially for PCOS which requires long-term commitment. Customers may fail because there is no one physically present to handhold them, so we ensure customer engagement, which is important for platforms like ours."*

CM2, a care manager and sales associate, described auditing fitness sessions and following up with customers to understand their exercise preferences.

> *"Some overweight customers were demotivated due to their inability to do certain exercises because of lack of individual attention. I work with the trainer to introduce easier versions of the exercise for them."*

The role of the care manager contrasts with self-tracking period and calorie-tracking apps by providing human support to achieve long-term changes. Platforms rely on care managers to help customers qualitatively contextualize their menstrual cycle, diet, and fitness data logged on the apps, rather than relying solely on automated algorithms for contextualization as has been earlier explored for PCOS [20].

Our findings suggest that human assistance in contextualizing progress motivates customers to better achieve their health goals, fostering collaborative iterations in the care process. Care workers thus perform connective labor and use their emotional skills to validate and support customers [73]. Such iterations, as Mol observes, are integral to the care process [62].

6 DISCUSSION

Our findings emphasize how PCOS platforms address gynaecological deficiencies offline by facilitating collaborative, personalized, iterative, and non-judgmental PCOS management as 'care' for this stigmatized condition. We identify FemTech logics of care and discuss their vulnerabilities as a care infrastructure, offering recommendations for 1. FemTech founders to build sustainable and inclusive platforms and 2. healthcare policymakers and gynaecological infrastructures to strengthen healthcare systems.

Our work contributes to HCI concerns in designing healthcare interventions for marginalized gender identities and sexual orientations [1, 45, 51], as well as the discourse on sustainable futures of care work [12, 39].

6.1 FemTech Logics of Care

PCOS platforms leverage established human and technological infrastructures to develop their logic of care. These infrastructures consist of health professionals from various domains ranging from gynaecologists to nutritionists, virtual communication platforms, payment gateways, and social media.

First, they leverage digital communication to address time and space deficiencies arising from the overburdened schedules of doctors. Second, they are attentive to the tensions in the cultural embeddedness of care [13] by sensitizing gynaecologists to decenter questions on fertility and weight loss that hinder PCOS consultations. Third, while Chopra et al. [20] recommend contextualized tracking to manage PCOS, we found that instead of mere tracking, platform customers situated their care experience in the interactions they had with care managers who supported and iterated on customers' health goals and relieved them from being solely responsible for their PCOS management.

Mol [62] observes that sustained interactions are a crucial aspect of the logic of care, embracing failures and iterations over achieving fixed health outcomes. Thus in FemTech logics of care, we find that PCOS platforms succeed in providing PCOS care.

However, as venture capital-funded technology start-ups, the FemTech logic of care is vulnerable in delivering long-term care due to profit-driven agendas. Next, while platforms reconfigure space and time for gynaecologists and sensitize them towards PCOS patients, it is the critical collaborative labor of care managers that operationalizes care delivery; prompting concerns about scalable human infrastructure. Similarly, despite PCOS platforms aiming to destigmatize the condition, they inadvertently reinforce traditional notions of womanhood and exclude queer populations, which compromises their potential to be inclusive care systems.

Building on Mol's work, we analyze the implications of this interplay between the logics of market and care embedded in the FemTech logics of care.

6.2 The Longevity of the FemTech Logic of Care

Similar to private hospitals' revenue targets, PCOS platforms are also driven by investor assessments of market needs, profit potential, and scalability, which makes it challenging for them to sustain uninterrupted, long-term care, vital for chronic conditions like PCOS.

Given their newness, none of the platforms we studied had secured funding beyond the preliminary Series A round, and one platform ceased operations due to funding constraints, leaving customers stranded. Consequently, the FemTech logic of care prioritizes investor accountability over customers, diminishing its claim of being an alternative to offline gynaecological systems and raising regulatory questions of patient protection.

In India, some components of digital healthcare are currently regulated. For instance, teleconsultation regulations mandate only licensed medical practitioners to practice with privacy safeguards for patients' electronic health data [24]. The Indian FemTech market, however, is currently unregulated [61], with no patient protection against incidents of abrupt care disruptions. Since state-market partnerships caution state interference in women's healthcare decisions through data surveillance [61], determining regulatory oversight for FemTech platforms should be treaded carefully.

A potential solution involves collaboration between medical practitioner bodies like the Indian Medical Association (IMA) and The Federation of Obstetrics and Gynaecological Societies of India (FOGSI) and FemTech platforms. These medical bodies can recommend patient protection guidelines for FemTech platforms, integrate sensitization modules in gynaecology curriculums, and advise practicing gynaecologists to shift focus from marriage and fertility to a holistic health-based approach in their interactions with patients who seek treatment for SRH concerns like PCOS.

Currently, PCOS platforms offer discounts on their care packages in a bid to acquire new customers. However, this may not be a sustainable business approach for platforms. Since FemTech platform services for SRH conditions like PCOS are currently not covered by health insurance, platforms could also lobby for insurance coverage of their services, aligning with the goal of supporting the longevity of the FemTech logic of care while safeguarding patient interests.

6.3 The Sustainability of the FemTech Logic of Care's Human Infrastructures

The FemTech care logic improves doctor-patient interactions by restructuring gynaecologists' work settings and minimizing their responsibilities to medical opinions. Conditions like PCOS, which don't require frequent in-person visits, make this arrangement favorable to patients and gynaecologists. Platforms also elevate gynaecologist profiles by providing training on patient interaction etiquettes, making it appealing for gynaecologists seeking professional visibility, a diverse customer base, extended patient engagement, and financial incentives. The increasing scarcity of gynaecologists in rural India, reported at 74.2% in 2022 [76], combined with rural patients favoring private healthcare over public facilities [77], may pose challenges for platforms in recruiting gynaecologists as they scale operations. The likelihood of heightened work demands on gynaecologists in private health institutions may exacerbate platforms' challenges with recruiting those who align with their brand values.

Second, platforms strategically employ 'care' to gain investor trust by measuring impact with weight loss metrics while customers value empathetic interactions with gynaecologists and care managers. Customer engagement in FemTech platforms is driven by employees in nutrition and operational roles, doubling as care managers. They play a crucial boundary-spanning role by following up with customers, reducing gynaecologists' coordination tasks. Care managers, akin to frontline health workers and medical support executives, foster long-term relations with patients beyond their formal responsibilities [33, 40, 41, 49, 98]. They also engage in collaborative sensemaking [62], a key feature of the care logic, but a feature absent in overburdened offline infrastructures, as noted in our findings.

Prior literature underscores the importance of collaborative tracking, recommending it for PCOS patients and doctors in the US [20]. However, such recommendations may not be feasible in India's strained gynaecological infrastructure [75], making the role of care managers even more significant.

Despite their vital role, care managers are not separately compensated for their responsibilities. To address overburdened infrastructure issues, platforms align temporarily with business needs by deploying additional responsibilities to professionals like nutritionists to retain customers – a common approach in markets prioritizing future improvement over past injustices [92]. Karusala et al. [41] stress the long-term value of considering care workers' perspectives in scaling healthcare interventions. As PCOS platforms expand, care managers' responsibilities are likely to grow. Founders should ensure fair compensation for care managers' emotional and collaborative labor, which is vital to care delivery. Encouraging customers to write testimonials highlighting their positive interactions with care managers can redirect investor attention to care managers' pivotal role in operationalizing care delivery and ensure adequate compensation for the role.

6.4 Orienting the FemTech Logic of Care to Feminist Ideals

Gynaecologists' minimal attention to PCOS and associated stigma, delays symptom management until fertility concerns arise [71].

Post-childbirth, AFAB women often cease PCOS care, as the condition doesn't significantly disrupt daily life. This differs from Mol's concept of an 'active patient' in diabetes care, where continual self-management is crucial. Notably, online PCOS platforms encourage active patient roles through collaboration with care managers, contrasting with offline gynaecologists who schedule follow-up visits every three months. While customers value personalized collaboration, we noticed women with children discontinuing PCOS care, suggesting that PCOS is no longer a concern once a woman's fertility and social standing linked to motherhood is secured.

We note that although platforms raise awareness about PCOS, they are still unable to prevent social concerns from triumphing over health concerns. This is similar to research by Ng et al. [67] who showed how economic rationale facilitated a market for a menstrual cup in Taiwan over women's autonomy in choosing a menstrual hygiene product. We propose that founders dismantle the link between PCOS and motherhood.

Emphasizing their commitment to science-backed services, platforms can clarify that PCOS persists irrespective of reproductive phases [69, 81, 86]. Such efforts may boost awareness and enhance healthcare for AFAB people across different age groups. This will also align with FemTech's feminist goals, expanding the customer base and supporting healthcare for all AFAB individuals.

6.5 Expanding FemTech's Targeted Logic of Care to Inclusive Care

Backed by market research, platforms strategically pitch their differentiated care to tech-savvy, urban, cis-het women who can afford their services. Therefore, the FemTech logic of care also creates a space infused with economic and class hierarchies that provides a premium, aesthetic healthcare experience and signals performative inclusion, such as asking customers their choice of pronouns, only to people who can afford it.

Mol notes the conflict between market-driven segmentation, which targets specific groups for business objectives, and a care-oriented approach that is inclusive and refuses to exclude anyone. This conflict is evident in the customer acquisition initiatives of PCOS platforms, where the market logic prevails. While a phygital platform addresses AFAB queer individuals for SRH concerns, other platforms hesitate to target diverse sexual orientations and gender identities until acquiring AFAB cis-het customers. Despite claiming to be inclusive and non-judgmental, these platforms lack representation of queer concerns, resulting in limited usage by the queer community. The platform's decision to not actively target queer individuals until scaling operations reflects a passive care logic, expecting queer individuals to initiate contact, if interested. Previous critiques of FemTech, too, highlight concerns about idealizing cisgender heterosexual users, making them non-inclusive infrastructures [27, 87, 102].

We encourage founders to center queer concerns not only in their social media posts, websites, or clinics but also in their core operations of customer acquisition and care delivery. Our findings highlighted that alienation in seeking PCOS care is heightened for queer individuals. Thus, collaborating with NGOs focused on queer sexual and reproductive health can initiate more inclusive care protocols for queer customers.

7 LIMITATIONS AND FUTURE WORK

Prior work on designing for women's health has considered the intersection of religious identity with information and healthcare-seeking practices [65]. For instance, following diets during festive and wedding seasons is a challenge for Indian women with PCOS [71]. We did not explicitly ask participants about the implications of their religious identity on their PCOS care-seeking practices as it was beyond the scope of our present endeavour.

Second, while PCOS platforms center 'care' in their services, 'care' was absent in PCOS-related weight loss programs on general fitness platforms. This raises important questions not only about the concept of care but also about the idea of FemTech. It can be addressed in future work by a comparative analysis between FemTech platforms invoking care and fitness platforms that neither align with care nor FemTech.

8 CONCLUSION

In this study, we conducted a comparative analysis between offline gynaecological infrastructures and FemTech platforms to explore distinct approaches to managing PCOS symptoms and uncover the dynamics of PCOS care and its delivery. We contribute to HCI and CSCW scholarship by identifying a FemTech logic of care and its vulnerabilities. Our study offers recommendations for policymakers and platform founders, to strengthen FemTech and offline healthcare infrastructures.

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