

# **A STUDY ON FEMTECH IN MANAGING PCOS SYMPTOMS AMONG INDIAN WOMEN**

Dissertation Submitted to



**The IIHMR University, Jaipur**

for the partial fulfillment for the award of the  
degree of Master of Business Administration

(MBA)

in

Hospital and Health Management

by

Dr. Bhagyashree Kelkar

Under the Supervision and Guidance of

Dr. Susmit Jain

2023

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## DECLARATION BY STUDENT

I hereby declare that this dissertation titled **A Study on FemTech in Managing PCOS symptoms among Indian women** is the bonafide record of my original researchwork. I declare that it has not been submitted to any other university or institution for the award of any degree or diploma. Information derived from the published or unpublished work of others has been duly acknowledged in the text.

Dr Bhagyashree Kelkar

19<sup>th</sup> May 2023

## CERTIFICATE

This is to certify that **Ms. Bhagyashree Kelkar** has successfully completed her dissertation project titled "**A Study on Femtech in Managing PCOS symptoms in Indian women**" in partial fulfillment of the requirements for the award of the degree of MBA (Hospital and Health Management) from the IIHMR University, Jaipur and has completed her internship at Healthark Insights, Ahmedabad during February 20-May 19, 2023.

She has always shown responsible attitude towards the tasks assigned to her and completed them within time with utmost sincerity. She is a good team player and supportive to her other colleagues in the organization.

Date: May 19<sup>th</sup>, 2023  
Place: Ahmedabad, Gujarat



Preceptor/Head of the Organization  
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## **CERTIFICATE**

This is to certify that dissertation titled **A STUDY ON FEMTECH IN MANAGING PCOS SYMPTOMS AMONG INDIAN WOMEN** is a record of the research work undertaken by Dr Bhagyashree Kelkar in partial fulfillment of the requirements for the award of the degree of MBA (Hospital and Health Management) from the IIHMR University, Jaipur under my guidance and supervision and her approach to the research study has been sincere, scientific, and analytical.

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## ABSTRACT

Submitted by: Dr. Bhagyashree Kelkar

Guided by: Dr. Susmit Jain

Roll No: 1271

Title of Study: *A Study on FemTech in managing PCOS Symptoms among Indian Women*

Women wear several hats. They manage both businesses and households and have a lot on their plate, which leads to neglecting their own health. But in urban areas, women's health issues, particularly those related to their sexual and reproductive health, still carry considerable stigma in India. The goal of these women-specific healthcare applications is to address a variety of medical problems, such as infertility, menstrual hygiene, birth control, and sexual wellbeing.

Polycystic Ovary Syndrome or PCOS is a hormonal problem affecting the ovaries and causing cysts in it. The prevalence of PCOS is 10% in Indian women. Female technology or FemTech are products or services like period tracking devices, catering to health needs of women.

The rationale behind taking up this research on FemTech and its use for managing symptoms of PCOS in India is due to limited access to healthcare, cultural considerations, lack of awareness, and the potential to empower women for long-term health management.

The study was carried with the following objectives:

- a. To assess the present scenario and market of FemTech for managing PCOD in India.
- b. To evaluate the perception of FemTech and its products among women of India

The research methodology used for this was descriptive type using qualitative data. Primary research was conducted to understand the level of knowledge and perception among women in India suffering from PCOS towards FemTech and its products. The sampling technique was non-random as the study was targeting only women with PCOS.

The study was carried out from March 1<sup>st</sup>, 2023 till May 19<sup>th</sup>, 2023 and the data was collected through an online google form.

The results showed a total of 301 responses gathered out of which 259 had PCOS and the maximum response was from age group 25-34 years. Irregular periods and acne and oily skin were the most common symptoms suffered. Almost 80 % of respondents hadn't used or heard about FemTech products and cited the reason as lack of information and knowledge and had doubts about the effectiveness of products. Out of almost 20% of respondents who had heard and used FemTech product, the most popular product came up to be period tracking app. The rating scale 4 was opted by maximum respondents for the Likert scale of 1 (least) to 5 (most) highlighting the levels of helpfulness of the products, the ease or accessibility to the product and the level of satisfaction towards the product. Almost 60% of the users of FemTech products responded positively to the improvements seen by them in managing their symptoms after using FemTech products.

This research has shed light on the awareness of FemTech solutions for managing polycystic ovary syndrome in India. The study revealed a significant lack of awareness about PCOS and its available technological solutions, such as mobile applications, wearable devices, and online platforms.

Key words: PCOS, FemTech, technology, perception, awareness, apps

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"The future belongs to those who believe in the beauty of their dreams, but it also belongs to those who are willing to work hard to make those dreams a reality." - Eleanor Roosevelt

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**Dr Bhagyashree Kelkar**

**1271**

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## **ABBREVIATION**

PCOS – Polycystic Ovarian Syndrome

FemTech – Female Technology

CAGR – Compounded Annual Growth Rate

US – United States

UK – United Kingdom

FICCI – Federation of Indian Chamber of Commerce and Industries

AI – Artificial Intelligence

ML – Machine Learning

## CHAPTER 1: INTRODUCTION

The history of women's reproductive health in India is a complex and multifaceted one, spanning centuries of cultural, social, and political change. Women health practices comprised of herbal remedies, yoga, and meditation during ancient India shrouded by secrecy and taboo. Although in recent decades, significant efforts have been put by government through various initiatives such as the National Rural Health Mission (2005) and the National Health Policy (2017) emphasizing the need for universal access to reproductive healthcare services. Although these efforts have been advocating more on maternal and child health, the nuanced areas of reproductive health are still ignored. One such area in Polycystic Ovary Syndrome or PCOS, a hormonal disorder affecting women.

Johns Hopkins has defined PCOS as a syndrome affecting the ovaries causing them to produce an abnormal quantity of androgen, which causes development of cysts in the ovaries. However, the causative factor is still not known. The symptoms include missed, irregular or light periods, hirsutism, weight gain, acne, thinning hair among a few. Treatment for PCOS depends on several factors. These may include age, severity of symptoms and overall health. It ranges from lifestyle modifications and medications, or a combination of both.<sup>1</sup>

Talking about today's world, there is a growing movement to increase awareness around PCOS in India. Several organizations, such as the PCOS Society of India, have been established to provide information and support to women with PCOS. In addition, healthcare providers are increasingly recognizing the importance of early diagnosis and management of PCOS with an increased focus on lifestyle interventions such as diet and exercise. Since several years, technology has revolutionized the way we live and work. This trend has extended to healthcare, with the emergence of FemTech – one area where FemTech has gained significant traction is in the management of Polycystic Ovary Syndrome.

FemTech refers to technological goods, services, and solutions that emphasize the wellbeing and health of women. It is a rapidly expanding industry that comprises a variety of technology, including menopause treatment options, breast pumps, pregnancy and lactation monitors, period monitoring applications, fertility tracking devices, and sexual health goods. FemTech businesses are often started and run by women who saw a need for improved healthcare options for women and set out to create novel, useful products to fill that need.

Recent years have seen a rise in the use of the term "FemTech" to emphasize the value of women's health and wellbeing and to promote investment in this expanding industry. It was named as such in 2016 by Ida Tin, the CEO of Clue, a menstrual track application. They are designed to address the unique health needs of women, which have historically been overlooked or underrepresented in the healthcare industry.

The Indian FemTech market is predicted to reach \$4 billion by 2024, with a CAGR of 12.9%, according to a survey by the Federation of Indian Chambers of Commerce & Industries (FICCI). There has been a sharp rise in the number of FemTech firms in India, many of which are devoted to improving the health of women, particularly regarding menstruation, fertility, maternal health, sexual wellness, and mental wellbeing.<sup>2</sup>

### **Evolution of FemTech globally and in India**

The evolution of FemTech globally and in India has been a remarkable journey that has transformed women's healthcare by harnessing the power of technology. Globally, the FemTech industry has witnessed exponential growth and recognition over the past decade. It started with the emergence of mobile applications focused on menstrual cycle tracking, which allowed women to monitor their periods, fertility windows, and symptoms conveniently. This sparked a movement in women's health, prompting entrepreneurs and innovators to explore other untapped areas of women's healthcare.

As the demand for FemTech solutions grew, the industry expanded to include wearable devices, smart sensors, telemedicine platforms, and remote monitoring tools. These innovations empowered women to take charge of their health by providing them with personalized insights, remote consultations with healthcare providers, and access to a supportive community. The evolution of FemTech globally has been fueled by increased awareness about women's health, advancements in technology, and a shift towards patient-centric care.

In India, the evolution of FemTech has been closely aligned with the country's digital transformation and changing societal attitudes towards women's health. With the advent of affordable smartphones and internet connectivity, a growing number of Indian women

gained access to technology, creating an opportunity for FemTech startups to cater to their unique healthcare needs.

The journey of FemTech in India began with the introduction of menstrual tracking applications, which gained popularity among young women. These apps allowed users to track their periods, ovulation, and symptoms, providing valuable insights into their reproductive health. As awareness about FemTech grew, Indian entrepreneurs and innovators recognized the need for localized solutions that addressed the specific challenges faced by Indian women.

The FemTech landscape in India expanded to include fertility management solutions, pregnancy care platforms, and sexual wellness applications. Startups introduced innovative concepts such as at-home fertility testing kits, telemedicine consultations for reproductive health, and community-driven platforms that offered support and information.

The Indian government's Digital India initiative, aimed at bridging the digital divide, played a significant role in supporting the growth of FemTech. It facilitated increased internet connectivity, digital literacy programs, and a conducive environment for technology startups to thrive.

Moreover, advocacy campaigns, social media movements, and the active involvement of influential personalities have helped break the silence and stigma surrounding women's health issues in India. This has created a supportive ecosystem that encourages open conversations about reproductive health, menstruation, and sexual wellness.

### **Examples of FemTech globally**

Clue is a popular menstrual tracking app that helps women track their menstrual cycles, fertility, and symptoms. It provides personalized insights and reminders based on the user's data. Clue aims to empower women with knowledge about their bodies and menstrual health.

Flo Health is a comprehensive women's health app that offers menstrual cycle tracking, fertility predictions, pregnancy and ovulation calendars, as well as personalized health insights. It also provides content on various topics related to women's health and well-being.

Ava is a wearable fertility tracker that uses sensors to monitor multiple physiological parameters, including skin temperature, heart rate variability, and breathing rate. It provides real-time data and predictions to help women identify their fertile days and maximize their chances of conception.

Natural Cycles is the first app to be certified as a contraceptive method in Europe. It uses a combination of daily temperature measurements and other factors to provide a fertility tracking method that can be used for both planning and preventing pregnancy.

Elvie offers a range of innovative pelvic floor products, including the Elvie Trainer, which is a wearable device that helps women strengthen their pelvic floor muscles through guided exercises and real-time feedback. They also provide the Elvie Pump, a silent and wearable breast pump.

Willow is a hands-free, wearable breast pump designed for nursing mothers. It allows women to pump discreetly and conveniently, with no external tubes or cords. Willow's technology enables women to pump on the go, without disrupting their daily activities.

Nurx is a telemedicine platform that offers convenient access to birth control, home STI testing, and PrEP (pre-exposure prophylaxis) for HIV prevention. The platform provides online consultations, prescription delivery, and ongoing support for women's reproductive health needs.

### **Examples of FemTech in India**

Companies like Bengaluru-based Plackal, whose app 'Maya' helps women manage their menstrual cycle and ovulation, has attracted over \$10 million in funding. Maya helps women better understand their reproductive health and plan for pregnancy or contraception

Baby Chakra, an online platform that connects parents with pediatricians and other childcare providers. It serves as a comprehensive online community where parents can connect with experts, share experiences, and access a wide range of resources related to pregnancy, child care, and parenting. BabyChakra offers articles, videos, and forums covering topics such as prenatal care, breastfeeding, baby development, nutrition, and parenting tips.

Another notable FemTech company is SUGAR, which offers a range of women's healthcare products, including menstrual cups, intimate washes, and pregnancy test kits. SUGAR emphasizes sustainability and affordability while ensuring women have access to high-quality and safe products.

Additionally, there is PregBuddy, a platform that provides personalized care and support to pregnant women. It connects expectant mothers with healthcare professionals, offers daily health tips, and facilitates community engagement for emotional support. PregBuddy aims to enhance the overall pregnancy experience and reduce maternal and infant mortality rates.

PinkBlueIndia is an e-commerce platform specializes in maternity and baby care products. It offers a wide range of items, including maternity wear, nursing essentials, baby clothes, toys, and accessories, catering to the needs of expectant mothers and new parents.

Niramai is an innovative startup that has developed a non-invasive, radiation-free, and privacy-aware breast cancer screening solution. Their AI-powered software uses thermal imaging and machine learning algorithms to detect early-stage breast cancer, enabling early intervention and potentially saving lives.

### **Benefits of FemTech**

They empower women to take charge of their health and well-being. Through mobile apps, wearables, and online platforms, women can monitor their menstrual cycles, track fertility, manage pregnancies, and access personalized health information. This self-care approach helps women make informed decisions about their health, understand their bodies better, and actively participate in their healthcare journeys.

FemTech solutions in India play a significant role in addressing menstrual health management, an area where there is often limited access to education, resources, and appropriate products. Menstrual tracking apps, period-tracking wearables, and online communities provide women with information about menstrual hygiene, cycle patterns, and related health concerns. This knowledge empowers women to track their cycles, manage symptoms, and seek appropriate care when needed.

FemTech offers valuable tools for reproductive health and family planning. It provides access to fertility tracking apps, ovulation prediction, and contraception reminders, enabling women to make informed decisions regarding contraception, family planning, and conception. These solutions can help in improving family planning outcomes, reducing unintended pregnancies, and supporting reproductive health choices.

FemTech solutions cater to the unique needs of pregnant women and new mothers. Pregnancy tracking apps offer personalized information, prenatal care reminders, and access to healthcare professionals. Postpartum support apps provide guidance on breastfeeding, baby care, mental health, and maternal recovery.

FemTech plays a crucial role in promoting sexual health and wellness among Indian women. It provides educational resources, information on sexual health concerns, and platforms for seeking advice and guidance. Online consultations and discreet delivery of products contribute to reducing the barriers and stigma associated with discussing and accessing sexual healthcare services.

The digital nature of FemTech generates vast amounts of anonymized health data, which can be leveraged for research and generating insights. Analysis of this data can help identify health trends, risk factors, and inform evidence-based interventions. Such insights can contribute to improving healthcare policies, resource allocation, and the development of more targeted and effective interventions.

### **Drawbacks of FemTech**

One major drawback is the limited accessibility and affordability of FemTech solutions, particularly in rural areas and among economically disadvantaged populations. The cost of smartphones, internet connectivity, and FemTech applications or devices may pose financial barriers for many women. Ensuring affordability and improving access to technology infrastructure are crucial for reaching a wider population.

Technological barriers, such as limited digital literacy and inadequate digital infrastructure, hinder the adoption and usage of FemTech. Many women, especially in rural areas, may lack

the necessary skills and familiarity with digital technologies to effectively engage with FemTech solutions. Additionally, inconsistent or unreliable internet connectivity can impede the seamless utilization of FemTech platforms and applications.

Cultural and social stigmas surrounding women's health topics can be a significant drawback for FemTech in India. Traditional beliefs, taboos, and societal norms may discourage women from openly discussing their health concerns or seeking digital solutions.

Data privacy and security are paramount when it comes to FemTech applications and platforms. Women may be hesitant to share sensitive personal health information due to concerns about data breaches, misuse of information, or privacy violations. Building trust through robust data protection measures, transparent privacy policies, and adherence to regulatory guidelines is essential to address these concerns and promote user confidence.

Another potential drawback of FemTech in India is the lack of inclusivity and representation. Many FemTech solutions are developed with a focus on urban users and may not adequately address the diverse needs and realities of rural women, marginalized communities, or women with specific health concerns. It is crucial to ensure that FemTech solutions are inclusive, culturally sensitive, and address the unique challenges faced by different segments of the population.

### **Drivers for FemTech in India**

India faces significant healthcare challenges, especially in rural and underserved areas. FemTech presents an opportunity to bridge this healthcare gap by providing accessible and affordable solutions for women's health. By leveraging technology, FemTech can offer remote consultations, health monitoring, and educational resources, thereby expanding healthcare access to remote areas where traditional healthcare infrastructure is limited.

FemTech empowers women to take control of their own health and well-being. It provides tools and information for reproductive health, menstrual management, fertility tracking, pregnancy care, and menopause support. By enabling women to monitor and understand their

bodies, FemTech helps them make informed decisions about their health, leading to improved health outcomes and increased autonomy.

FemTech has the potential to shift the focus from reactive healthcare to preventive care. Through apps, wearables, and digital platforms, FemTech encourages regular health tracking, early detection of potential issues, and proactive measures for preventive care. By promoting awareness, education, and timely interventions, FemTech can contribute to reducing the burden of preventable diseases and improving overall health outcomes.

With the advancements in data analytics and artificial intelligence, FemTech can provide personalized and customized solutions tailored to individual women's needs. By analyzing health data, FemTech can offer personalized recommendations, insights, and interventions specific to each user's health profile. This level of customization enhances the effectiveness and relevance of healthcare interventions, leading to improved health outcomes.

FemTech in India has the potential to foster collaboration among various stakeholders, including healthcare providers, technology developers, researchers, and policymakers. Collaboration can drive innovation in the FemTech space, leading to the development of new solutions, improved user experiences, and enhanced healthcare delivery models.

### **Restraints to FemTech in India**

Access to technology, particularly smartphones and reliable internet connectivity, remains a significant restraint for FemTech adoption in India. While smartphone penetration has increased in recent years, there is still a considerable gap, particularly in rural and underserved areas. Limited access to technology hinders women's ability to engage with FemTech solutions and access the benefits they offer.

Low digital literacy levels and limited awareness about FemTech solutions pose challenges to adoption. Many women, especially in rural and marginalized communities, may not be familiar with digital platforms, mobile applications, or the potential benefits of FemTech for their health. Addressing the digital literacy gap and raising awareness through targeted education campaigns is crucial to overcome this restraint.

Cultural stigmas and taboos surrounding women's health can act as a significant restraint for FemTech adoption. In India, discussions around women's reproductive health, menstruation, or sexual well-being may be considered taboo in certain communities. Overcoming these cultural barriers requires sensitization efforts, culturally sensitive messaging, and creating safe spaces for open conversations about women's health.

Affordability is a significant factor that impacts the adoption of FemTech solutions. Many FemTech apps, devices, or services may come with a cost, making them inaccessible to individuals with limited financial resources. Affordability concerns can create barriers to adoption, particularly among lower-income populations. Developing cost-effective solutions and exploring partnerships with public and private entities to subsidize or provide affordable options can help mitigate this restraint.

Regulatory and policy challenges can also hinder the growth of FemTech in India. The evolving regulatory landscape around healthcare apps and devices, data privacy, and medical regulations can create uncertainty for FemTech companies. Compliance with existing regulations, navigating complex approval processes, and ensuring data privacy and security can be time-consuming and resource-intensive for FemTech startups and organizations.

### **A rural India perspective**

Rural India presents unique challenges and opportunities when it comes to the adoption and implementation of FemTech solutions. While there has been significant progress in improving access to healthcare in rural areas, the penetration of FemTech remains relatively low. Limited access to technology, including smartphones and internet connectivity, hampers the widespread adoption of FemTech solutions.

In many rural communities, the availability of electricity is also a concern, making it difficult for women to utilize digital platforms. Additionally, the level of digital literacy and awareness about FemTech is relatively low among rural women, which further hinders their engagement with these solutions.

Cultural and social factors, including deeply ingrained beliefs, taboos, and stigmas surrounding women's health, pose additional challenges. Addressing these challenges requires a multi-pronged approach that focuses on improving access to technology and

connectivity in rural areas, enhancing digital literacy and awareness through community-driven initiatives, and culturally sensitive interventions that take into account the local context.

It is crucial to engage with rural communities, local healthcare providers, and grassroots organizations to build trust, educate, and tailor FemTech solutions to meet the specific needs and preferences of rural women. By addressing these challenges and fostering inclusivity, FemTech has the potential to bridge the healthcare gap and empower women in rural India to take control of their health and well-being.

### **Government Initiatives for FemTech in India**

The Government of India has recognized the importance of FemTech and has taken several initiatives to support and promote its growth. Here are a few notable government initiatives:

**National Digital Health Mission (NDHM):** Launched in 2020, NDHM aims to establish a digital ecosystem for healthcare in India. It includes the creation of a unique health ID for every individual, enabling seamless access to health records and teleconsultations. FemTech solutions can align with NDHM's objectives by integrating their services into this digital framework, ensuring interoperability and secure data exchange.

**Atal Innovation Mission (AIM):** AIM is a flagship initiative of the government to promote innovation and entrepreneurship in India. It supports startups and provides resources, mentorship, and funding opportunities. FemTech startups can leverage AIM's incubation centers, funding schemes like the Atal Innovation Mission Fund, and the Atal Incubation Centers to accelerate their growth and development.

**Startup India:** The Startup India initiative aims to create a favorable ecosystem for startups in India. It provides various benefits, such as tax exemptions, simplified regulations, and access to funding. FemTech startups can avail themselves of these benefits to foster innovation, attract investments, and scale their operations.

**Digital India:** The Digital India campaign seeks to transform India into a digitally empowered society and knowledge economy. The focus on digital infrastructure, connectivity, and

digital literacy provides a solid foundation for the adoption and success of FemTech solutions, enabling better access and reach to women across the country.

Ayushman Bharat - Pradhan Mantri Jan Arogya Yojana (PMJAY): PMJAY is a government-funded health insurance scheme that aims to provide affordable healthcare to the underprivileged. FemTech companies can collaborate with the scheme to offer cost-effective and accessible healthcare solutions to women, particularly in rural and underserved areas.

### **Regulation scenario in India**

The regulation of FemTech in India is a crucial aspect to ensure the safety, efficacy, and ethical use of technology-driven solutions for women's health. Currently, there is no specific regulatory framework tailored exclusively for FemTech in the country. However, several existing regulations apply to different aspects of FemTech services.

For instance, the Medical Device Rules 2017 govern the manufacturing, import, sale, and distribution of medical devices, including certain FemTech devices such as fertility trackers or diagnostic tools. Data protection and privacy regulations, such as the Personal Data Protection Bill (currently under review), are relevant for safeguarding the personal health data collected and processed by FemTech companies.

Additionally, the Telemedicine Practice Guidelines issued by the Indian Medical Council provide guidelines on the remote delivery of healthcare services, including teleconsultations, which are often utilized by FemTech platforms. To ensure effective regulation, there is a need for a comprehensive and specific framework that addresses the unique characteristics of FemTech, including data privacy, security, and quality control. It should also foster innovation and collaboration between regulatory bodies, healthcare professionals, and FemTech companies to ensure that these solutions meet the highest standards of safety, accuracy, and user protection. Clear regulations will provide a foundation for the growth of FemTech in India, building trust among users, investors, and stakeholders while promoting the development of innovative and impactful solutions for women's health.

## **Investment Opportunities for FemTech in India**

Investing in mobile applications focused on women's health can be a lucrative opportunity. These apps can cover various aspects of women's health, including menstrual tracking, fertility tracking, pregnancy care, postpartum support, and menopause management. Features such as personalized health insights, remote consultations with healthcare professionals, and community forums can enhance user engagement and drive revenue generation through subscriptions, in-app purchases, or targeted advertising.

Wearable devices tailored for women's health can be another promising opportunity. These devices can include smartwatches, fitness trackers, or specific wearables designed for tracking menstrual cycles, fertility, or pregnancy. Integrating advanced sensors, AI algorithms, and user-friendly interfaces can provide valuable health insights, real-time monitoring, and personalized recommendations. Revenue streams can include device sales, subscriptions for premium features or data analytics, and partnerships with healthcare providers.

Telemedicine platforms that focus on women's health offer convenient and accessible healthcare services. Investing in telemedicine startups that provide virtual consultations, remote monitoring, and e-prescriptions for women's health concerns can be a promising opportunity.

Digital therapeutics involve evidence-based digital interventions that address specific health conditions. Investing in FemTech startups that develop digital therapeutics for women's health conditions like polycystic ovary syndrome (PCOS), gestational diabetes, postpartum depression, or menopause symptoms can be a lucrative opportunity. These solutions can provide personalized treatment plans, behavior change programs, and ongoing support. Revenue models can include licensing agreements, partnerships with healthcare providers, or reimbursement through health insurance.

Investing in FemTech companies that leverage data analytics and artificial intelligence (AI) technologies can be a promising opportunity. These companies can develop algorithms and AI models that analyze health data to provide personalized insights, predictive analytics, and early detection of health risks. Such solutions can attract investments through partnerships with healthcare providers, pharmaceutical companies, or insurance providers.

Health Education and Awareness: Investing in initiatives that focus on health education and awareness among women can have a significant impact on their overall health outcomes. This could involve supporting organizations that provide educational content, conduct workshops, or create awareness campaigns around women's health topics.

Investing in FemTech marketplaces and e-commerce platforms can connect users with a wide range of women's health products and services. These platforms can offer a one-stop-shop for FemTech solutions, including menstrual products, fertility kits, prenatal and postnatal care products, and wellness services. Revenue models can include commissions from product sales, subscription fees for premium features, or partnerships with healthcare providers and manufacturers.

### **Outlook for FemTech in India**

The future of FemTech in India looks promising and holds significant potential for growth and impact. Several factors contribute to this positive outlook. Firstly, there is an increasing awareness and demand for women-centric healthcare solutions. Women in India are becoming more proactive about their health and seeking personalized, accessible, and convenient services. FemTech companies are well-positioned to cater to these evolving needs through technology-driven solutions.

Secondly, the rapid digital transformation in India, along with the growing penetration of smartphones and internet connectivity, provides a favorable environment for the adoption of FemTech. As more women gain access to smartphones and digital platforms, they can easily avail themselves of FemTech services and resources, leading to improved health outcomes and better healthcare experiences.

Furthermore, the Indian government has been actively promoting digital health initiatives and innovation. Initiatives like the National Digital Health Mission and supportive policies encourage the development and adoption of digital health solutions, including FemTech. This creates opportunities for collaboration, funding, and regulatory support, fostering a conducive ecosystem for FemTech companies to thrive.

Innovation and technological advancements will continue to drive the future of FemTech in India. AI, machine learning, data analytics, and wearable devices will play a significant role in delivering personalized and data-driven solutions for women's health monitoring, fertility tracking, pregnancy care, and overall well-being.

As FemTech companies continue to evolve and refine their offerings, partnerships with healthcare providers, insurance companies, and government initiatives will likely increase. These collaborations can lead to improved integration of FemTech solutions into mainstream healthcare systems, ensuring seamless coordination, continuity of care, and a more holistic approach to women's health

Hence this research is carried with the aim to understand the usage of FemTech in managing symptoms of PCOS in India and to get an overview of its landscape. The study will also exhibit primary research encompassing the perception of women towards FemTech products and services to understand their point of view which can help identify whitespaces. With these gaps, future opportunities will also be considered and how these can bridge the gaps.

The objective of this research is to assess the present scenario of FemTech for managing PCOS in India and to evaluate future potential of FemTech for improving by identifying whitespaces.

## CHAPTER 2: REVIEW OF LITERATURE

| Title                                                                                                  | Author                                                                 | Study location | Sample Size | Year of Study | Salient Features                                                                                                                                                                                                                                                                                                                                                                                                     |
|--------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|----------------|-------------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The role of menstrual apps in healthcare: provider and patient perspectives <sup>3</sup>               | Bryndl E Hohmann<br>Marriott, A<br>Tiffany Williams, E<br>Jane Girling | New Zealand    | 144 women   | 2023          | <p>Respondents are using symptom monitoring and smartphone calendars to enhance patient-provider contact, but they are also concerned about data accuracy and other uses of the data.</p> <p>Aotearoa New Zealand-specific menstruation issues, diseases, and life stages could be better addressed in apps, according to respondents, who also noted that the existing selection of applications is restricted.</p> |
| Tales of self-empowerment through digital health technologies: a closer look at ‘FemTech’ <sup>4</sup> | Tereza Hendl,<br>Bianca Janskya                                        | N/A            | N/A         | 2023          | <p>FemTech innovations, such as menstruation and fertility trackers, offer to empower its users by giving them trustworthy information about, control over, and ownership of their bodies and reproductive health.</p> <p>Thoughtful consideration should be given to the idea of empowerment offered by period and fertility apps.</p>                                                                              |

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|                                      |                   |     |     |      | <p>Investigating the sort of empowerment offered by app suppliers and identify substantial inconsistencies and conflicts in the discursive stories of empowerment based on a theme analysis of a variety of "female health" app advertising materials.</p> <p>Finding that the discourse promoting many health apps is based on excluding the ontologies normative femininity, epistemic injustice, and heterosexuality principles of female sexuality, which weakens the liberational discourse of these digital health technologies.</p> <p>Analysis also draws on electronic sociological research and intersectional feminist scholarship.</p> |
| FemTech and Older Women <sup>5</sup> | Alan S. Gutterman | N/A | N/A | 2023 | <p>Although estimates of the scale of the prospects for FemTech firms are remarkable, the overall amount of venture capital money allocated to</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

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|  |  |  |  |  | <p>companies focused on women's health and/or FemTech remains a relatively small portion of the total funding allocated to healthcare companies that serve all people, not just women.</p> <p>The demand for gender-specific healthcare solutions extends beyond maternity and child care, family planning, and fertility.</p> <p>FemTech investors and entrepreneurs have been sluggish to broaden their emphasis to cover these additional areas.</p> <p>For instance, women are 1.5 times more likely than men to experience musculoskeletal illnesses and autoimmune diseases, and they are twice as likely as men to experience sadness and anxiety.</p> <p>Additionally, there needs to be more focus on enhancing the general health and welfare of women.</p> |
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| Usage of mobile health interventions among obese PCOS patients undergoing assisted reproductive technology treatment during the COVID-19 pandemic <sup>6</sup> | Meiying Sang, Qing Wu, Yanyuan Tao, Feifei Huang, Lianlian Lu, Wenting Zhou, Axiang Li, Shun Bai | University of Science and Technology of China - First Affiliated Hospital | 79 overweight/obese patients in WeChat application | 2022 | <p>In comparison to the control group, the WeChat group had a higher percentage of patients who lost weight.</p> <p>Furthermore, it was discovered that WeChat group with PCOS had a better live birth rate than patients in the control group.</p> <p>Reduction of weight were enhanced for PCOS patients receiving ART with lifestyle changes utilizing the WeChat app.</p>                                                    |
| Vision: Too Little too Late? Do the Risks of FemTech already Outweigh the Benefits? <sup>7</sup>                                                               | Maryam Mehrnezhad, Laura Shipp, Teresa Almeida, Ehsan Toreini                                    | N/A                                                                       | N/A                                                | 2022 | <p>The paper describes the many attackers that potentially expose FemTech IoT users to the danger of sensitive data being improperly managed, misused, or appropriated.</p> <p>The dangers of the industry increase as it grows, thus it is critical to conduct study on the permitted, technological and the continuing human aspects of this problem.</p> <p>We demonstrate that, despite FemTech devices' widespread use,</p> |

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|                                                        |                        |     |     |      | <p>their hazards substantially exceed their advantages unless more is done to safeguard user confidentiality and safety.</p> <p>We draw attention to these problems and immediately encourage deeper investigation into them.</p>                                                                                                                                                                                                                                                                                      |
| FemTech A Feminist Technoscience Analysis <sup>8</sup> | Madelin Burt-D'Agnillo | N/A | N/A | 2022 | <p>Women's identities and menstrual hygiene technologies are coevolving, and FemTech and its antecedent menstrual technology advances offer an opportunity for feminist technoscience analysis.</p> <p>Instead of being associated with an explicitly feminist, social justice agenda, femitech is more closely associated with the the financialization of society and commercialization of women's bodies.</p> <p>Men gain from femitech's concealment of menstruation, protection of women's employment rights,</p> |

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|                                                                                                                |                   |     |     |      | <p>and commoditization of cycle and menstrual data.</p> <p>The privacy of paper-based monitoring is outweighed by the ease of utilising an app to monitor menstruation.</p> <p>Individual efforts to track menstrual cycles fall short and do little to challenge the "big data" concepts that are now driving a lot of advancements in reproductive technologies.</p>                                                                            |
| Monitoring Female Fertility Through 'FemTech': The Need for a Whole-System Approach to Regulation <sup>9</sup> | Catriona McMillan | N/A | N/A | 2022 | <p>FemTech creates complex challenges that axiomatically demand for complex solutions; yet, a method to governing FemTech that focuses on fertility-related concerns has only been addressed thus far with the law.</p> <p>FemTech apps are unlikely to develop into as efficient and dependable as consumers require them to be until this occurs.</p> <p>Yet it is simpler to recognise systemic issues than to fix them, as this article's</p> |

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|                                                                                  |                                                                                               |                                            |              |      | <p>findings demonstrate.</p> <p>It would be a difficult task to reduce the danger and harm brought on by oppression, historical and institutionalized prejudice, and the forces of the free market, to mention a few.</p> <p>Additionally, it would be foolish to try to solve this problem all at once in any endeavor.</p>                              |
| Characterization of PCOS in Flo application user in the world <sup>10</sup>      | Tarun Jain, Olivia Negris, Danielle Browne, Isabel Galic, Rodion Salimgaraev, Ludmila Zhanova | USA, Philippines, UK, India, and Australia | India-40,092 | 2021 | <p>Philippines had the largest percentage of users among the top five nations, followed by India, the UK, the US, and Australia.</p> <p>Indian doctors diagnosed PCOS the most frequently, followed by Filipino doctors. Among Indian women with PCOS, baldness, hyperpigmentation, and irregular periods were the most frequently reported symptoms.</p> |
| FemTech: Digital Help for Women's Health Care Across the Life Span <sup>11</sup> | Brenda K. Wiederhold                                                                          | N/A                                        | N/A          | 2021 | <p>Even though women make up over half of the world's population, the number of technology firms that cater to their</p>                                                                                                                                                                                                                                  |

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|                                                                     |                                     |                      |                                 |      | <p>unique healthcare requirements only makes up a tiny portion of the overall technology industry.</p> <p>FemTech, or female technology, produced \$820.6 Mn in global sales and \$592 Mn in venture capital investment in 2019.</p> <p>FemTech generally consists of services, goods, and software developed to satisfy the specific biological and medical needs of women.</p> <p>According to recent estimates, the industry might grow to \$1.1 Bn by 2024.2 FemTech raised \$190 Mn in Europe in 2019 and was expected to raise \$98 Mn so far in 2020.</p> <p>When compared to the less than \$500 Bn annual market for women's medical spending, these figures appear nearly insignificant.</p> |
| Enhancing PCOS awareness using private social network <sup>12</sup> | Mohammed Alotaibi, Amani Ali Shaman | Tabuk, Saudi Arabia. | Fifty women diagnosed with PCOS | 2020 | The study showed how mobile technologies, such as the private social network, might raise awareness of the                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |

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|                                                                                                                          |                                   |                                                      |                                     |      | <p>condition among Saudi women.</p> <p>Disease is managed over the application through messages and feedback is provided through the application, it can also help in cost cuts and save time by reducing hospital visits.</p>                                                                                                                                                                                                                                                                                                                                    |
| Lifestyle Interventions for PCOS: Cross-Sectional Survey to Assess Women Treatment and Outcome Preferences <sup>13</sup> | Laura R Saslow and James E Aikens | Through online survey website—Amazon Mechanical Turk | 197 women with self-identified PCOS | 2020 | <p>Programs targeting weight, diabetes prevention, menstrual cycle control, hirsutism, anxiety, and depression were of great interest to at least half of the 197 respondents.</p> <p>Half of the respondents said they would be okay with changing their stress, sleep and physical activity, and below half said they would be okay to follow low-carb, or low-glycemic index diet.</p> <p>Half of the respondents showed interest in online-mentorship or mobile programs. Greater body mass index was associated with needing help with weight reduction,</p> |

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|  |  |  |  |  | <p>increase in energy and stress relief.</p> <p>There was an association between younger ages and the need of treatment for acne and fertility.</p> |
|--|--|--|--|--|-----------------------------------------------------------------------------------------------------------------------------------------------------|

### **CHAPTER 3: RESEARCH METHODOLOGY**

The study is descriptive in nature with primary research as a part of it along with secondary research. The study was undertaken from 1<sup>st</sup> March to 19<sup>th</sup> May 2023. The timing set for data collection was 1<sup>st</sup> April to 1<sup>st</sup> May 2023. The primary research was carried out using google form and distributed through online methods amongst women having PCOS. The women were requested to circulate the google form in a snowball technique to garner more responses. The sample size collected was 301 women with PCOS with age range from 15 years to 45 years for the pilot study.

The following criteria was included in the study:

- i. Women aged 15-45 years having PCOS.
- ii. Women having access to internet or mobile phone.
- iii. Women in urban or semi urban areas

The following was the exclusion criteria:

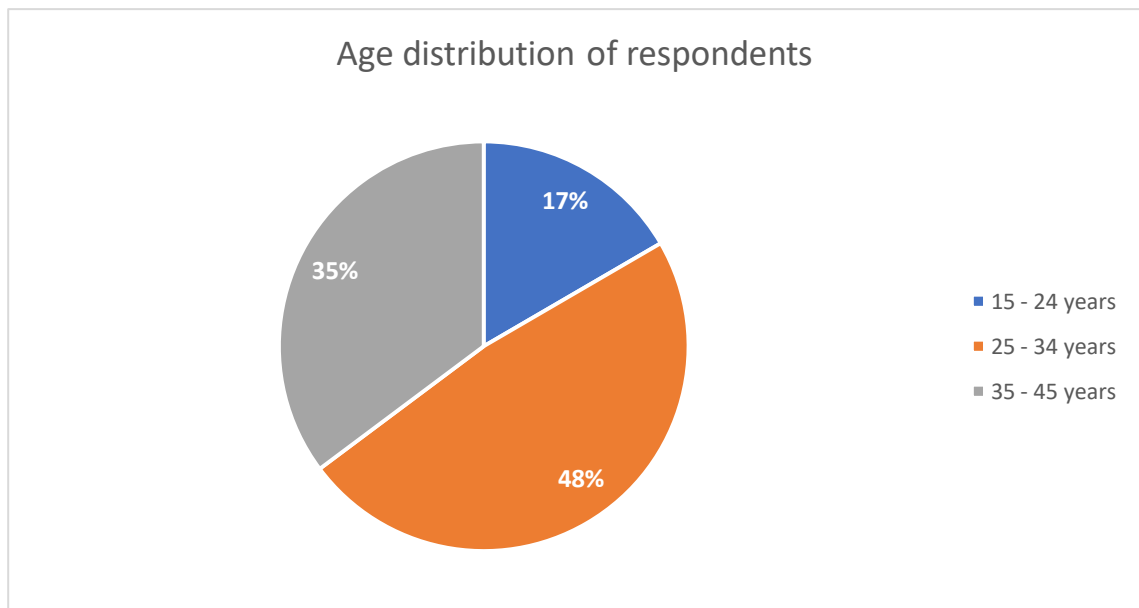
- i. Women below 15 years and above 45 years with PCOS
- ii. Pregnant women
- iii. Women living in rural areas.

### **3.1 Data Collection Tools and Method**

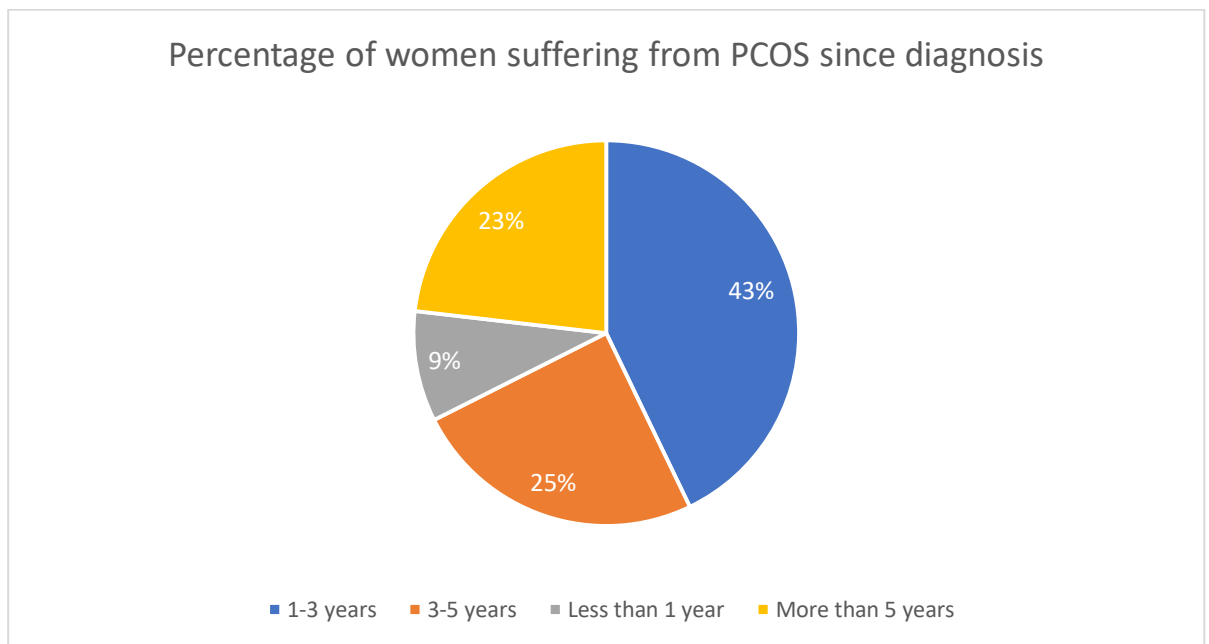
- With a thorough literature review on the existing content on polycystic ovary syndrome and FemTech from India and other countries, some insights were drawn as to what could be included in the survey. The review helped in attaining the basic overview of the perception of FemTech and its uses and how its beneficial in various countries. Research articles on India were less in comparison to other countries on the same. The research articles were found through PubMed, ResearchGate and Google Scholar
- The data collection tool used was a google form. The form had 15 structured and close ended questions divided into three sections to meet the objective of the study. The sections catered to people who have used FemTech to manage PCOS symptoms and those who haven't as well.
- Non-random sampling technique was used because the study specifically targeted only women suffering from PCOS.
- The google form was first circulated amongst women close in contact with the researcher who were asked to fill the form only if they have PCOS. The women were also asked to circulate the form among other known women to them who also suffer from PCOS to garner maximum responses. Anonymity and privacy were maintained and conveyed on the google form itself. No emails were collected to maintain the anonymity.
- The responses collected through the google form were converted into an Excel spreadsheet. With the help of graphical presentations in the form of tables and charts, inferences were drawn, and results were portrayed using frequency distribution tables.

## CHAPTER 4: RESULT

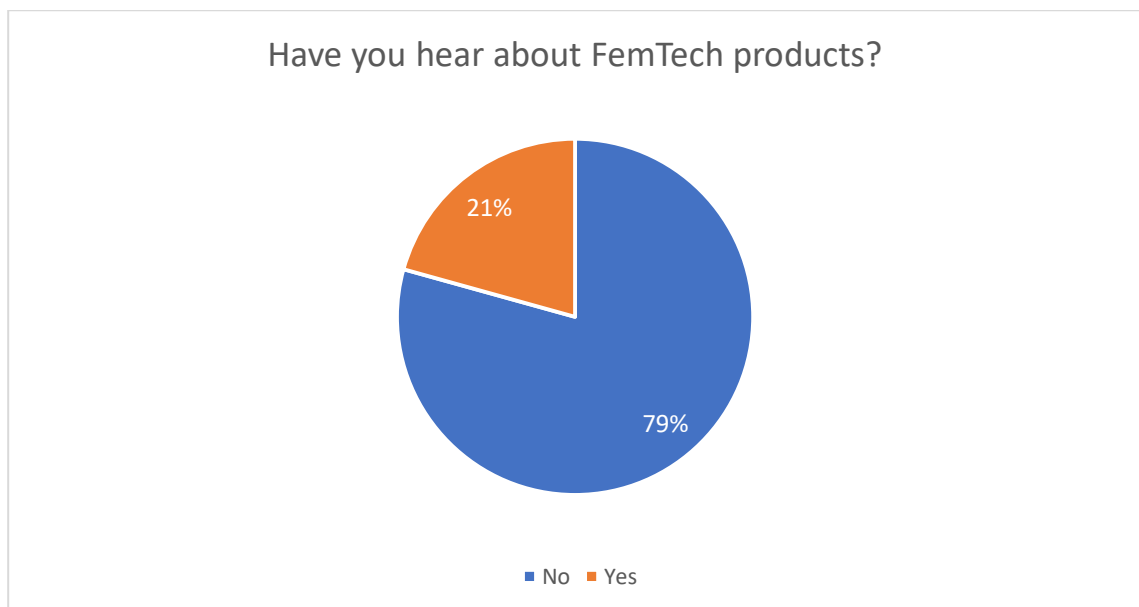
- The results of the research were formed from 301 responses initially on which the age distribution chart was plotted. Out of these 301 women, 42 women didn't have PCOS and hence their survey ended in the first section.
- The rest of the survey was based of 259 women who had PCOS, and they were referred to the next sections according to how they answered the survey questions.
- The google form also mentioned that if they wish to withdraw from the current study, they can do so voluntarily at any point. Emails, names, and phone numbers were not collected to maintain privacy and anonymity so that participants feel comfortable answering the questions.
- Given below are figures which were obtained as results from the survey conducted.



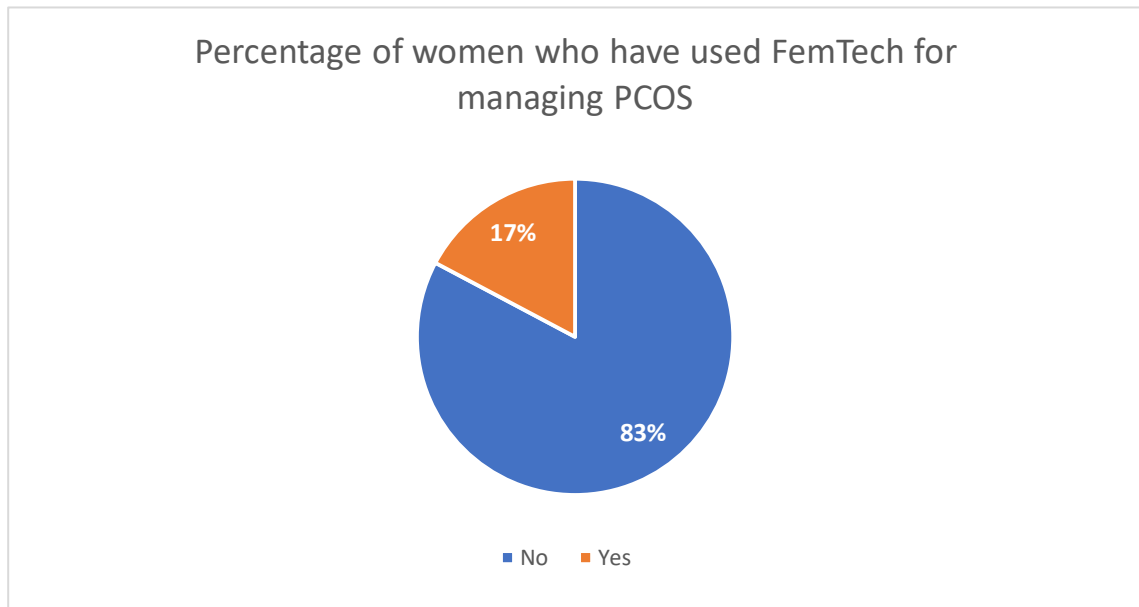
**Figure 4.1: Percentage of age distribution of the study participants aged between 15 years to 45 years of total 301 respondent (N=301)**



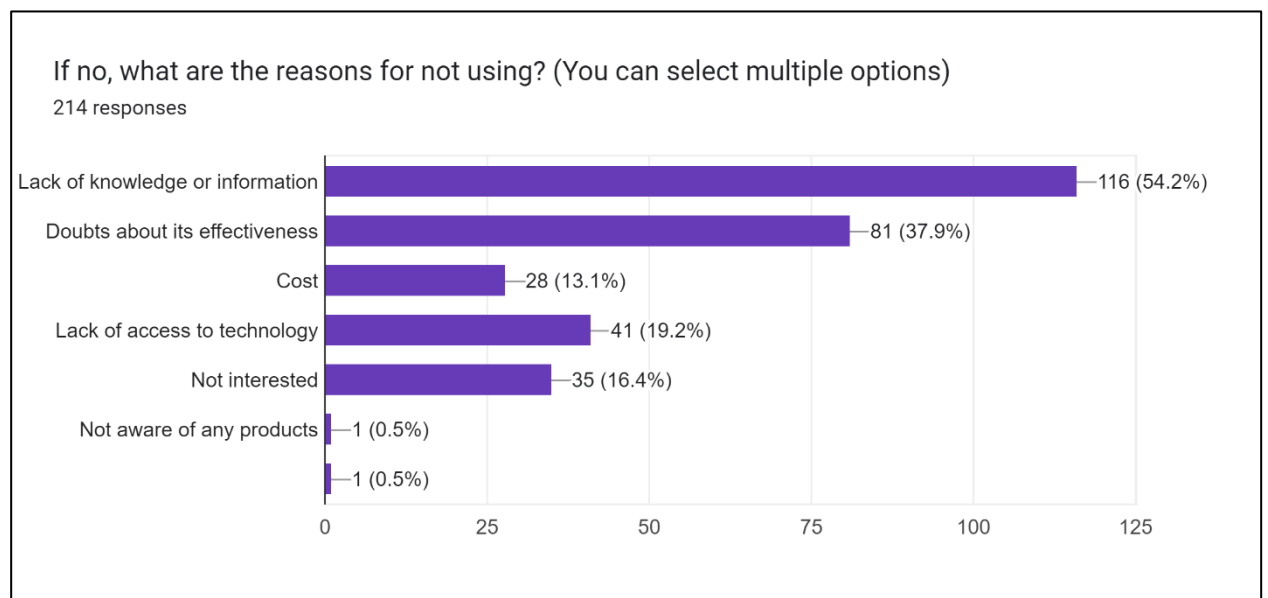
**Figure 4.2: Distribution of study participants who have suffered from PCOS since diagnosis (N=259)**



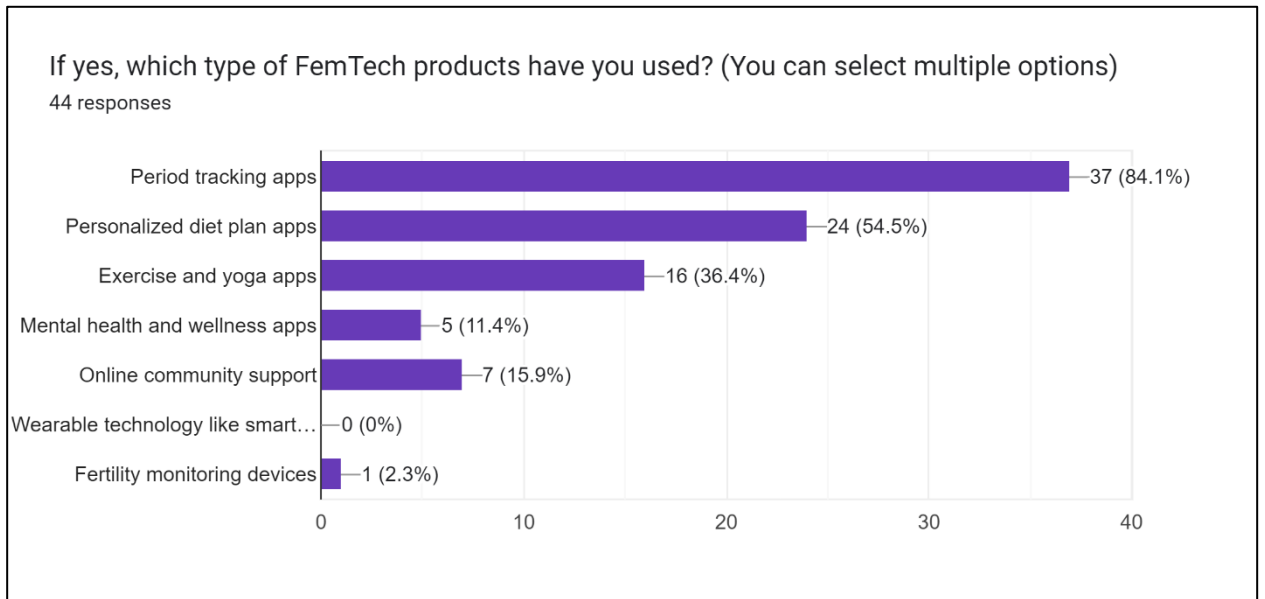
**Figure 4.3: Percentage distribution of study participants on their knowledge of FemTech products (N=259)**



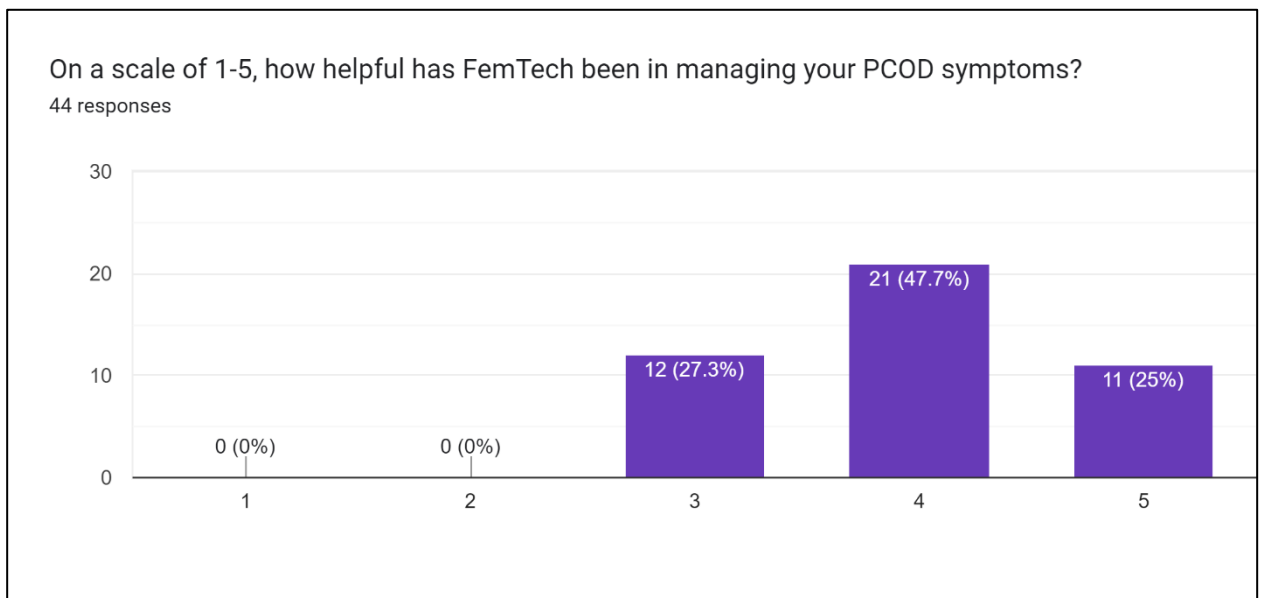
**Figure 4.4: Percentage distribution of study participants who have been using FemTech for managing their PCOS symptoms (N=259)**



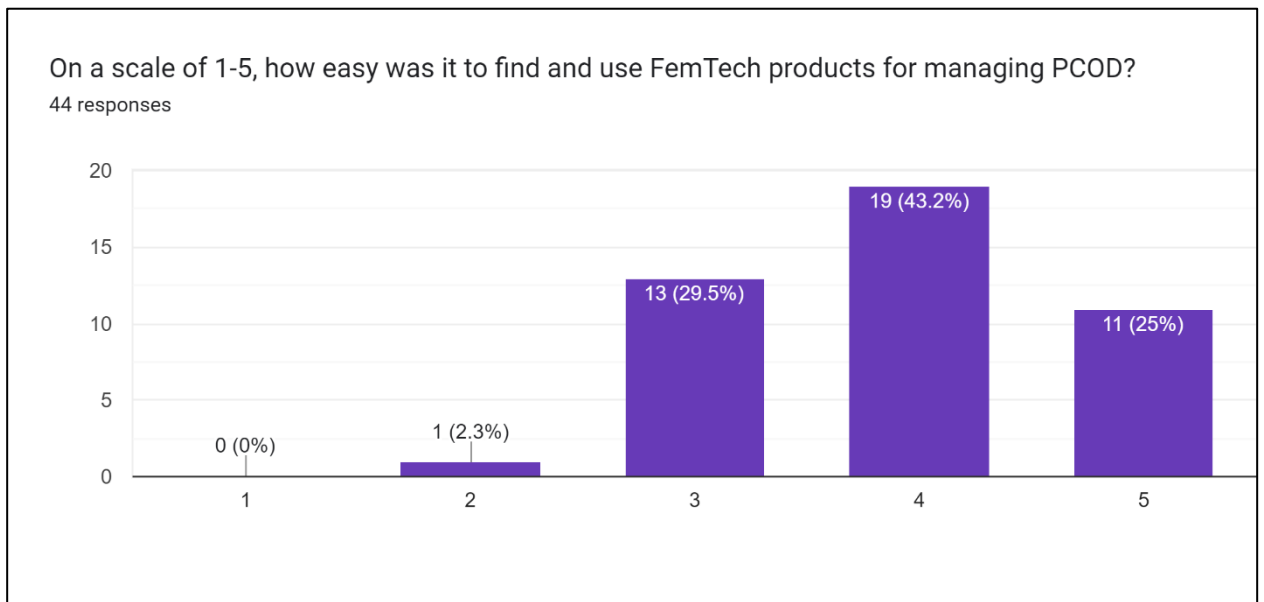
**Figure 4.5: Percentage distribution of reasons cited by women for not using FemTech products (N=215)**



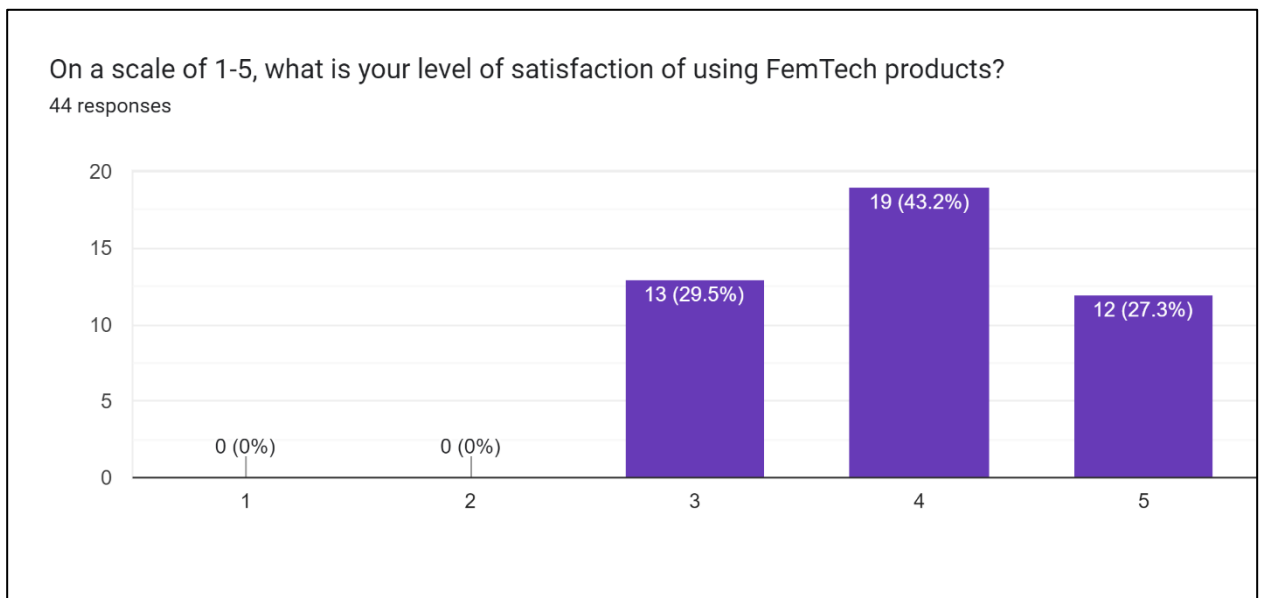
**Figure 4.6: Percentage distribution of FemTech products frequently used by women (N=44)**



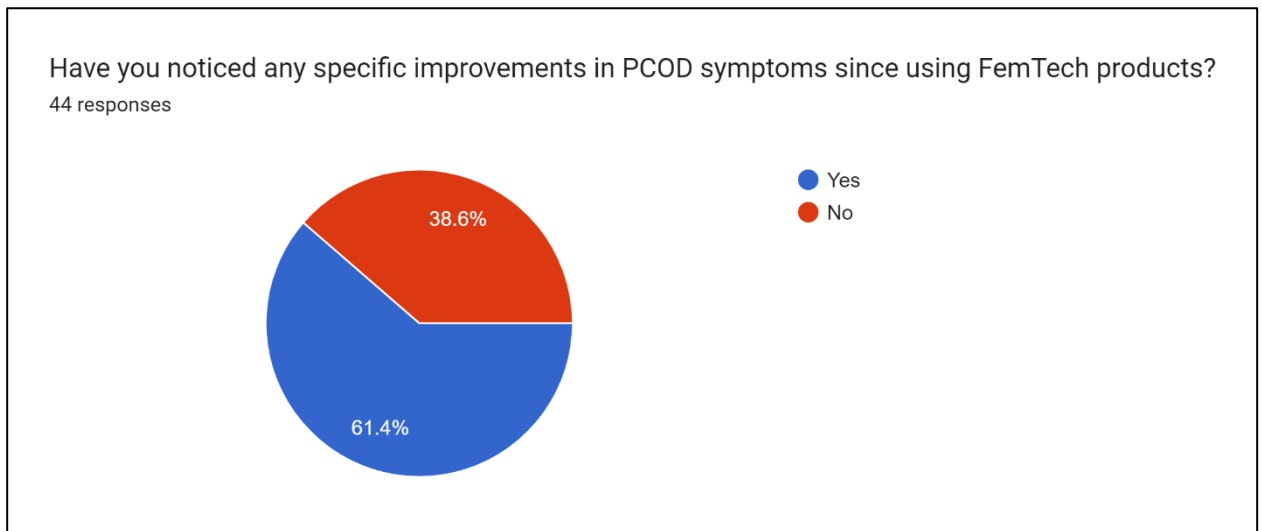
**Figure 4.7: Percentage distribution of linear scale on the level of helpfulness of FemTech products, 1 being not helpful at all and 5 being most helpful (N=44)**



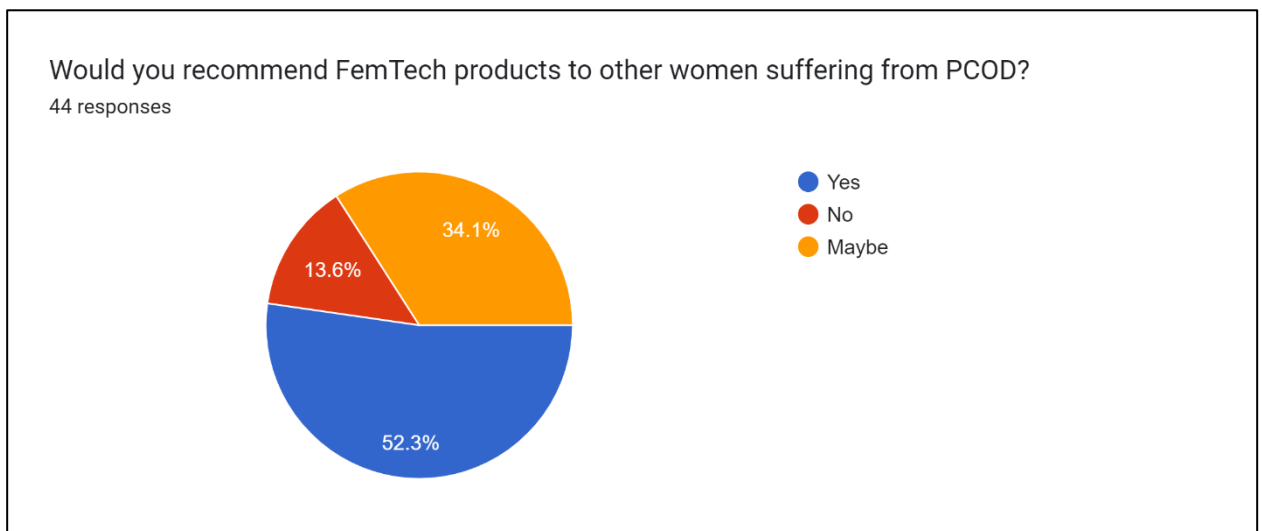
**Figure 4.8: Percentage distribution of linear scale on the level of ease of finding a FemTech products, 1 being very difficult and 5 being very easy (N=44)**



**Figure 4.9: Percentage distribution of linear scale on the level of satisfaction of using a FemTech products, 1 being completely dissatisfied and 5 being very satisfied (N=44)**



**Figure 4.10: Percentage distribution of study participants on if they noticed any improvement made by FemTech products in managing their symptoms (N=44)**



**Figure 4.11: Percentage distribution of study participants who would recommend FemTech products to others suffering from PCOS (N=44)**

## CHAPTER 4.1: INTERPRETATION OF THE GRAPHS

- The total responses got from the google form was 301 respondents. Out of these 259 women had PCOS and they were considered for the further surveys and women who didn't have PCOS were eliminated through google form submissions.
- Figure 4.1 shows the age distribution of the study participants, in which age group 15-24 years comprised of 17%, age group 25-34 comprised of 48% and age group 35-45 comprised of 35%.
- Figure 4.2 shows that out of 259 women suffering from PCOS, 42.9% had been suffering for 1-3 years, followed by 24.7% for 3-5 years, 23.2% for more than years and 9.3% for less than a year.
- Figure 4.3 shows that there were only 20.5% women who had heard of a concept called as FemTech and knew of its products, which had been specified in the question. The rest of the respondents which is 79.5% hadn't heard about or knew any FemTech related products.
- Figure 4.4 shows that there were only 17% women out of 259 respondents who were currently using or had used FemTech product for managing their PCOS symptoms.
- Respondents who hadn't heard or used any products were directed to the next section of the google form where reasons were asked as to why they don't use products and multiple choice were given to them highlighting common problems.
- Figure 4.5 shows that 54.2% respondents said that lack of knowledge or information was the reason they were not using FemTech products or had any idea about it, 37.9% women had doubts about the effectiveness of the products, 13.1% gave cost as the reason, 19.2% chose lack of access to technology as the reason, and 16.4% of respondents were not interested in knowing about it
- To the women who responded that they had used FemTech were directed to another section which had different questions. There were only 44 responses to this section.
- A question was asked about the types of FemTech products commonly used by women and they had an option of choosing multiple options highlighted in Figure 4.6. It showed that 84.1% were using period tracking app, 54.5% were using personalized diet plan, 36.4% were using yoga and exercise apps, 15.9% were using

online community support groups via apps, 11.4% were using mental health and wellness apps, and 2.3% were using fertility monitoring devices.

- A Likert scale question was asked to gauge the helpfulness of FemTech products on the scale of 1 to 5, 1 being least helpful and 5 being most helpful.
- Figure 4.7 shows that 47.7% women answered level 4 as the helpful level, 27.3% answered 3 level and 25% said they were completely helpful.
- Another numeric scale question was asked on the ease of finding a FemTech product on a scale of 1 to 5, 1 being very difficult and 5 being most easy.
- Figure 4.8 shows that 43.2% answered level 4 in the ease of finding a product, 29.5% answered level 3 and rest answered as level 5.
- Another numeric scale question was asked on the level of satisfaction of using a FemTech product on scale of 1 to 5, 1 being least satisfied and 5 being most satisfied.
- Figure 4.9 shows that 43.2% answered level 4, 29.5% answered level 3 and the rest were completely satisfied with the products.
- These women were also asked if by using any FemTech products they had seen changes or if it has been effective to manage their symptoms. Figure 4.10 shows that 61.4% women answered “Yes” and the rest answered “No”.
- They were then asked to describe the changes or improvements that they have seen. The answer was a short description type. The answers that were got were improvements in tracking period, helping in weight loss through exercise apps, helped women to balance their mental health via exercises and yoga.
- A question was asked to women if they would recommend any FemTech products to other women who were also suffering from PCOS. Figure 4.11 shows that 52.3% responded yes, 34.1% said maybe and the rest said no.
- They were also asked what improvements they would like to see in FemTech products, and this was a short description question. The answers that were obtained were motivation in terms of rewards, diet plans with more food preferences, mental health support only for women with a female doctor, less cost for consultation.

## CHAPTER 5: DISCUSSION

From the above results we can see that the maximum respondents were from the age category 25-34 years old. The results also showed that maximum respondents had been suffering from PCOS for 1-3 years. “Irregular periods” and “Acne/Oily skin” came out to be the most common symptoms of PCOS that respondents were facing.

When questions on their knowledge and use about FemTech and its products to manage their PCOS symptoms were asked to the respondents, maximum number of respondents answered negatively (~80%). This shows that even though FemTech has been in India and with multiple initiatives being already on their way, respondents still didn’t have any knowledge or information about the concept of FemTech and how it can help them.

In a section directed for women who answered “No” on the awareness and use of FemTech products, the common reasons were cited, and an option was given to highlight other reasons apart from the ones mentioned. “Lack of knowledge or information” and “Doubts about its effectiveness” got the maximum percentage from the respondents. This highlights the fact that interventions need to be made to engage women into increasing their knowledge about FemTech and its effectiveness. Some respondents also chose “Not interested” as their option which can be managed only through making women aware about such kind of technology and making them accessible to them.

Among the participants who responded positively on the knowledge and use of FemTech products (~20%), “Period tracking device” and “Personalized diet plan apps” got the maximum responses. These apps are commonly available to women who generally have access to technologies, like mobile phones, tablets, laptops etc. There are multiple freemium apps available like Flo, Clue, Clover who provide personalized trackers, online community support and even diet plans on subscription.

A Likert scale was developed to gauge the perception of women using FemTech products to understand where they stand helpfulness of the product, the ease of finding the product and the level of satisfaction after using the product. On a scale of 1 to 5, maximum women rated “4” on all these 3 aspects, which showed that they find products quite helpful, easy to find and are satisfied with it.

Out of women who used FemTech products, 40% said they noticed positive changes and improvements in their symptoms. This shows that among women who are using products, effectiveness has not been compromised and these products do help in a way for better management of the symptoms. The improvements have been highlighted in the results section. More than 50% said that they would recommend FemTech products to other women to help managing their symptoms which shows that users of the products can be engaged into advocating for a variety of products.

A general opinion of respondents was taken to see what more improvement they would like to see in the product and its features. Maximum respondents highlighted the importance of “Motivation in terms rewards” and others wanted “More diet/ingredients options as per their choice.”

## CHAPTER 6: CONCLUSION

After conducting research, it can be said that FemTech has the potential to significantly improve the lives of women with PCOS. PCOS is a prevalent condition affecting many women in India, and the lack of awareness and social stigma surrounding it often makes it difficult for women to access proper care. FemTech solutions such as mobile apps, wearables, and telemedicine services can provide women with PCOS with easy access to information, support, and personalized healthcare. These solutions can help women manage their symptoms, track their menstrual cycles, monitor their weight, and make informed decisions about their health.

However, there are several challenges that need to be addressed for FemTech to be more widely adopted in India. These include the lack of internet access and digital literacy among certain populations, the need for culturally sensitive and language-appropriate solutions, and the need for more extensive research to validate the effectiveness of FemTech solutions in managing PCOS.

Culturally sensitive and user-friendly FemTech solutions have the potential to revolutionize PCOS management in India, providing accessible and personalized support to women in need. It is crucial to collaborate with healthcare providers, policymakers, and technology developers to promote the adoption and integration of FemTech solutions into the healthcare system, ultimately improving the overall well-being and long-term health outcomes of women with PCOS in India. By promoting FemTech awareness, Indian women can gain greater control over their health outcomes. FemTech solutions offer convenience, accessibility, and privacy, allowing women to monitor their health, track symptoms, and receive personalized recommendations. This can enable early detection of health issues, such as polycystic ovary syndrome (PCOS), endometriosis, and cervical cancer, leading to timely interventions and improved health outcomes.

FemTech awareness can also address the taboo and silence surrounding women's health issues in Indian society. By openly discussing and promoting FemTech solutions, it helps break down societal barriers and encourages conversations about reproductive health, menstruation, sexual well-being, and fertility. This can contribute to destigmatizing these topics, reducing shame, and empowering women to seek support and treatment without hesitation.

FemTech awareness is crucial for Indian women as it empowers them with knowledge, control over their health, and access to healthcare. By embracing FemTech, Indian women can overcome barriers, receive personalized care, and actively participate in decisions related to their well-being. FemTech has the potential to bridge healthcare gaps, destigmatize women's health issues, and contribute to economic growth. It is imperative to prioritize FemTech awareness campaigns, invest in research and development, and collaborate across sectors to ensure that Indian women reap the benefits of these transformative technologies.

## **6.1: Recommendations**

1. FemTech companies could collaborate with physicians and gynecologists who can endorse their products to patients in order to boost visibility and credibility and inform other doctors about how FemTech solutions could help manage PCOS. These doctors can also cooperate with medical groups and host workshops.
2. Social media marketing for enhancing the information portal can be used. Women in India frequently use social media sites like Facebook, Instagram, and Twitter. These platforms can be used by FemTech businesses to market their goods and services. To broaden their audience, these social media sites can also work with bloggers and influencers who focus on women's health.
3. There are numerous societies who advocate for issues related to women's reproductive health like PCOS Society of India, Federation of Obstetric and Gynecological Societies of India (FOGSI), Indian Fertility Society (IFS). Women looking for knowledge on controlling their disease can benefit greatly from PCOS societies or groups. FemTech businesses can interact with these groups and provide details about their solutions. These societies can also support the events and webinars that these FemTech organizations can host.
4. FemTech businesses should produce locally adapted content for the Indian market so that women can better understand it in their own language and through pictorial representation. This covers the use of words, cultural allusions, and visuals. FemTech business can also collaborate regional content producers and local news channels to maximize their outreach to women in various areas.
5. When it comes to taking care of women's health, cost is a big concern. FemTech businesses ought to provide reasonably priced, widely available solutions. They may also think about collaborating with healthcare organizations to sell their products at discounted prices.

6. The FemTech business can also offer digital literacy programs to women, especially in rural areas, to enhance their familiarity and comfort with using technology. They can conduct training sessions to teach women how to navigate and utilize FemTech solutions effectively. They can also partner with local community organizations and government initiatives focused on digital literacy can be beneficial.
7. FemTech businesses can develop FemTech solutions with user-centric design principles, considering the unique needs, preferences, and cultural factors specific to Indian women. They can engage women in the design and development process through focus groups, surveys, and feedback loops to ensure that the solutions meet their requirements effectively.
8. FemTech businesses can engage with regulatory authorities to create an enabling environment for FemTech companies in terms of regulations, standards, and approvals. Streamlining the regulatory processes can encourage more companies to enter the Indian market and foster innovation in the FemTech sector.

## CHAPTER X: REFERENCES

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## ANNEXURE 1

# A Study on FemTech for Managing PCOS

The purpose of this survey is to understand the level of awareness and user perception among women who suffer from PCOS/PCOD about female technology products. Your participation in this survey is voluntary and all responses will be kept confidential and anonymous.

bhagyashree@healtharkinsights.com [Switch account](#)



Not shared

\* Indicates required question

How old are you? \*



15 - 24 years



25 - 34 years



35 - 45 years

Have you been diagnosed with PCOS(Polycystic Ovary Syndrome)? \*



Yes



No

**(If the respondents answered no, the form ended on the next page)**

# A Study on FemTech for Managing PCOS

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Not shared

\* Indicates required question

If you have been diagnosed with PCOS, then proceed with the next section.

How long have you been suffering from PCOS? \*

- ☐ Less than 1 year
- ☐ 1-3 years
- ☐ 3-5 years
- ☐ More than 5 years

What are your symptoms for PCOS? \*

(You can select multiple options)

- ☐ Irregular periods
- ☐ Acne and oily skin
- ☐ Excessive body hair
- ☐ Weight gain
- ☐ Baldness or thinning hair
- ☐ Other: \_\_\_\_\_

Have you heard of FemTech products (includes period tracking apps, wearable devices like smart watch, hormone tracking apps, etc) before? \*

- ☒ Yes
- ☐ No

Have you ever used FemTech to manage your PCOS symptoms? \*

- ☐ Yes
- ☐ No

**(If the respondents answered No in both or in the question “Have you ever used FemTech to manage your PCOS symptoms”, the respondents were directed to a separate page shown below)**

# A Study on FemTech for Managing PCOS

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Not shared

If you haven't used FemTech products, proceed with this section

If no, what are the reasons for not using? (You can select multiple options)

☐

Lack of knowledge or information

☐

Doubts about its effectiveness

☐

Cost

☐

Lack of access to technology

☐

Not interested

☐

Other:

[Back](#)

[Submit](#)

[Clear form](#)

**(If the respondents answered “Yes” to the above section highlighting if they have used or heard about FemTech and its products they were directed to the below section)**

If you have used FemTech products, please continue with the questions.

If yes, which type of FemTech products have you used? (You can select multiple options) \*

- ☐ Period tracking apps
- ☐ Personalized diet plan apps
- ☐ Exercise and yoga apps
- ☐ Mental health and wellness apps
- ☐ Online community support
- ☐ Wearable technology like smart watch, fitness tracker
- ☐ Fertility monitoring devices
- ☐ Other: \_\_\_\_\_

On a scale of 1-5, how helpful has FemTech been in managing your PCOS symptoms? \*

|             |                       |                       |                       |                       |                       |                   |
|-------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-------------------|
|             | 1                     | 2                     | 3                     | 4                     | 5                     |                   |
| Not helpful | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Extremely helpful |

On a scale of 1-5, how easy was it to find and use FemTech products for managing PCOS? \*

|                | 1                     | 2                     | 3                     | 4                     | 5                     |           |
|----------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------|
| Very difficult | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Very easy |

On a scale of 1-5, what is your level of satisfaction of using FemTech products? \*

|                         | 1                     | 2                     | 3                     | 4                     | 5                     |                      |
|-------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|----------------------|
| Completely dissatisfied | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | Completely satisfied |

Have you noticed any specific improvements in PCOS symptoms since using FemTech products? \*

- ☐ Yes
- ☐ No

If yes, please describe the improvements.

Your answer

Would you recommend FemTech products to other women suffering from PCOS? \*

- ☐ Yes
- ☐ No
- ☐ Maybe

What changes or innovations or improvements do you want to see in FemTech products?

Your answer

Back

Submit

Clear form

**(The google form ended after this)**

## ANNEXURE 2

| Dissertation Final Draft 4.0 |                                                                                                                                                                            |              |                |
|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|----------------|
| ORIGINALITY REPORT           |                                                                                                                                                                            |              |                |
| 8%                           | 6%                                                                                                                                                                         | 2%           | 4%             |
| SIMILARITY INDEX             | INTERNET SOURCES                                                                                                                                                           | PUBLICATIONS | STUDENT PAPERS |
| PRIMARY SOURCES              |                                                                                                                                                                            |              |                |
| 1                            | Submitted to IIHMR University<br>Student Paper                                                                                                                             | 1            | 1 %            |
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| 4                            | Tereza Hendl, Bianca Jansky. "Tales of self-empowerment through digital health technologies: a closer look at 'Femtech'",<br>Review of Social Economy, 2021<br>Publication | <1           | <1 %           |
| 5                            | www.scilit.net<br>Internet Source                                                                                                                                          | <1           | <1 %           |
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