National College of Ireland

Project Submission Sheet

Student Name:	**Ajay Sopan Dhulugade**		
Student ID:	**23304111**		
Programme:	**MSc in Management**	**Year:**	**2024- 2025**
Module:	**Dissertation**		
Lecturer:	**Barry Coughlan**		
Submission Due Date:	**15-08-2025**		
Project Title:	**Digital Therapeutics in India's Pharmaceutical Industry**		
Word Count:	**16344**		

I hereby certify that the information contained in this (my submission) is information pertaining to research I conducted for this project. All information other than my own contribution will be fully referenced and listed in the relevant bibliography section at the rear of the project.
ALL internet material must be referenced in the references section. Students are encouraged to use the Harvard Referencing Standard supplied by the Library. To use other author's written or electronic work is illegal (plagiarism) and may result in disciplinary action. Students may be required to undergo a viva (oral examination) if there is suspicion about the validity of their submitted work.

Signature:	**Ajay Dhulugade**
Date:	**12-08-2025**

PLEASE READ THE FOLLOWING INSTRUCTIONS:

1. Please attach a completed copy of this sheet to each project (including multiple copies).
2. Projects should be submitted to your Programme Coordinator.
3. **You must ensure that you retain a HARD COPY of ALL projects**, both for your own reference and in case a project is lost or mislaid. It is not sufficient to keep a copy on computer. Please do not bind projects or place in covers unless specifically requested.
4. You must ensure that all projects are submitted to your Programme Coordinator on or before the required submission date. **Late submissions will incur penalties.**
5. All projects must be submitted and passed in order to successfully complete the year. **Any project/assignment not submitted will be marked as a fail.**

Office Use Only	
Signature:	
Date:	
Penalty Applied (if applicable):	

AI Acknowledgement Supplement
[Insert Module Name]
[Insert Title of your assignment]

Your Name/Student Number	Course	Date
23304111	MSc in Management	12-08-2025

This section is a supplement to the main assignment, to be used if AI was used in any capacity in the creation of your assignment; if you have queries about how to do this, please contact your lecturer. For an example of how to fill these sections out, please click here.

AI Acknowledgment

This section acknowledges the AI tools that were utilized in the process of completing this assignment.

Tool Name	Brief Description	Link to tool
Grammarly	A tool to fix grammatical errors	https://www.grammarly.com/

Description of AI Usage

This section provides a more detailed description of how the AI tools were used in the assignment. It includes information about the prompts given to the AI tool, the responses received, and how these responses were utilized or modified in the assignment. **One table should be used for each tool used**.

Grammarly
Inserted sentences for error checking.

Evidence of AI Usage
This section includes evidence of significant prompts and responses used or generated through the AI tool. It should provide a clear understanding of the extent to which the AI tool was used in the assignment. Evidence may be attached via screenshots or text.
Additional Evidence:
[Place evidence here]
Additional Evidence:
[Place evidence here]

Submission of Thesis and Dissertation

National College of Ireland
Research Students Declaration Form
(Thesis/Author Declaration Form)

Name: Ajay Dhulugade

Student Number: 23304111

Degree for which thesis is submitted: MSc in Management

Title of Thesis: Digital Therapeutics in India's Pharmaceutical Industry

Date: 12-08-2025

Material submitted for award

A. I declare that this work submitted has been composed by myself. ✓

B. I declare that all verbatim extracts contained in the thesis have been distinguished by quotation marks and the sources of information specifically acknowledged. ✓

C. I agree to my thesis being deposited in the NCI Library online open access repository NORMA. ✓

D. ***Either*** *I declare that no material contained in the thesis has been used in any other submission for an academic award.
Or *I declare that the following material contained in the thesis formed part of a submission for the award of
_____
(State the award and the awarding body and list the material below) ✓

TABLE OF CONTENT

Abstract

This study investigates the influence of Digital Therapeutics (DTx) on sales and marketing approaches and practices in the context of India's pharmaceutical industry. Because DTx is still in its rising stage in India, the study investigated how pharmaceutical companies, DTx developers, and pharmacists are developing their practices, to move to a healthcare system leverages digital accounts in DTx. Using a qualitative approach, seven semi-structured interviews were conducted with marketers from the largest pharmaceutical companies in India, digital health developers, and pharmacists.

Thematic analysis identified six major themes: marketing strategies evolving to focus on the patient, the importance of trust, working as a bundled DTx with traditional medications, users engaging when DTx is personalized, the emergence of pharmacists as supporters of DTx & the urban-rural divide of adoption. A major barrier, regulatory ambiguity was discussed as limiting marketing campaigns and patient trust. While pharmacists were believed to be important mediators of DTx, barriers still exist for them to drive marketing efforts, primarily lack of training and no clear communication or helpful resources.

This findings underscores the need to clarify regulations, to provide notice to those who will be involved in the DTx implementation process, and for products that will facilitate and be respectful of culturally appropriate scaling of DTx across India. For example, despite the fact the CDSCO has provided some draft guidance around Software as a Medical Device (SaMD), none specifies approvals or labelling requirements that are unique to DTx. Thus, companies that are introducing, say, a diabetes management app in Hindi and Marathi, still have to rely on generic claims that “supports health” i.e., just label it as a support not therapeutic. These limitations limit the company's ability to market a product effectively and also limits trust for the patient especially when products are aimed at illiterate or semi-urban/rural populations that have additional language and cultural needs. Limitations to the study, such as small sample size and qualitative study limits, restricts the scope and leads therefore to recommendations indicating that an evaluation that includes a mix of methods with more cultural representatives in future studies is justified.

List of keywords:

Digital Therapeutics (DTx), Pharmaceutical Marketing, Healthcare Innovation, Regulatory Challenges, Consumer Trust, Patient Engagement, Digital Health, Personalisation, Bundling Strategy, Urban-Rural Divide, Data Privacy, Competitive Dynamics, HealthTech, Behaviour Change, Digital Empathy, India's Pharmaceutical Industry, Digital Therapeutics Adoption, Healthcare Policy, DTx Marketing Strategies, Qualitative Research, Thematic Analysis.

Chapter 1: Introduction

The world is undergoing transformation due to the emergence of Digital therapeutics in healthcare (Choudhury et al., 2023). Digital therapeutics (DTx), which refer to evidence-based, software-driven treatment methods designed to prevent, manage, or treat medical conditions (Digital Therapeutics Alliance, 2023), are emerging as a transformative element in healthcare delivery. DTx starting to gain attention in India's evolving healthcare sector. As DTx grows globally, it is likely to reshape how Indian pharmaceutical companies operate, especially in marketing and sales. Consider mobile DTx applications for diabetes management such as Wellthy CARE in India that offers AI-driven coaching and glucose monitoring support and mobile DTx for mental health such as the evidence-based, AI-enabled cognitive behavioural therapy (CBT) app Wysa to help manage stress, anxiety, and depression. As opposed to clinician-supervised DTx, which are prescribed and followed up directly as part of a treatment plan by health professionals who qualified to do so, direct-to-consumer DTx are marketed and accessed in a mostly digital manner such as web, platforms, mobile apps, etc., and in the absence of any clinical oversight. While clinician-supervised DTx are made effective by being integrated into the most efficient and effective delivery of care, direct-to-consumer DTx depend primarily upon digital marketing and self-initiated and driven patient use. This new source of DTx presents great possibilities, greater reach, rapid patient adoption, availability and great risks, especially as it relates to regulatory compliance, patient trust, and ensuring correct use, especially within the area of the pharmaceutical landscape in India. While there are a handful of global studies to explore DTx clinical and business effectiveness, comparatively few have examined how DTx are

changing marketing, sales, and distribution channels for the pharmaceutical industry, especially in developing markets like India. Much of the work on digital health in India has focused either on telemedicine or e-pharmacy, or continuing to discuss issues regarding the digital infrastructure, but not nearly as much examining the various challenges of the marketing of regulated software-based therapies to distinct segments of the consumer market. In other contexts, one can see, for example Germany has an evaluation of the Digital Health Applications (DiGA) reimbursement programme (Kraus et al., 2024), and how regulated DTx marketing strategies differ by patient demographic, reimbursement pathway, or clinical pathways. This gap in academic research and the industry also raises an important question: what, if any, changes are digital therapeutics making to the marketing and sales paradigm in India's pharmaceutical industry? The growth of DTx and digital infrastructure in India brings a challenge to companies in how they respond to marketers, regulators, and competitors within a saturated market.

This research is important because DTx is a relatively new concept in India's pharmaceutical landscape, which is expected to reach $130 billion by 2030 (FICCI, 2022). As smartphone use grows and healthcare becomes increasingly digital, the way companies market treatments is also evolving. This shift brings challenges related to regulation, public trust, and infrastructure. Additionally, the study expands on the idea of India's electronic health governance, looking at schemes such as the Ayushman Bharat Digital Mission (ABDM) - a scheme launched by the Government of India to create a cohesive digital health system across the nation. The scheme also aims to provide every citizen with a unique digital health ID, brings health records from public and private facilities into a cohesive unified system and better access to healthcare services through consistent digital health systems. Since the ABDM is very new, this research is timely. I have a particular interest in how DTx contrasts with traditional marketing of the pharmaceuticals due to my training as a consumer and public policy attention as a pharmacy graduate.

This research explores a niche within digital health on how pharma companies in India are adapting their marketing approaches to the rise of digital therapeutics. Almost all studies have focused on the clinical acceptance of DTx (Sinha & Rahul, 2023) and consumer acceptance (Choudhury et al., 2023), but very few have the marketing aspect within India. For instance, Sharma & Gupta (2022) emphasize the importance of digital health marketing

through social media, but do not specifically address DTx. Similarly, international studies (Dang et al., 2020) offer global insights but overlook the unique challenges faced in the Indian market, such as regulatory ambiguity and diverse digital literacy levels. Also, there appears to be a gap in studies into DTx marketing from an international perspective (e.g., Dang et al., 2020), that neglect and overlook India's unique DTx marketing issues. For example, market challenges that include a lack of operational flexibility of the Central Drugs Standard Control Organisation (CDSCO), and different levels of digital literacy from rural to urban communities. The focus of this study will address this knowledge gap by considering how Indian pharma executives have planned and market DTx, the factors and motivations that encourage consumer acceptance, the ability of different competitive factors can directly affect the marketing of DTx, and the strategies employed by them, therefore, a framework can be developed to improve DTx marketing.

While there is a body of literature, there are some gaps. For example, Sinha and Rahul (2023) state that DTx operates in a personalised app form to facilitate patient engagements, which may provide a huge benefit in terms of marketing but no country-based analysis on India exists. Choudhury et al. (2023) consider trust and cultural nuances involved in DTx take-up in an Indian context and do not speculate on how marketers could address those factors. Dang et al. (2020) report on global DTx marketing trends, such as influencer collaborations, but they may not entirely capture the Indian market’s diversity. These gaps in the literature including limited research on India-specific DTx marketing strategies, regulatory challenges, and cultural adoption barriers, highlights the need for a focused study. This research aims to address that gap by exploring how pharmaceutical executives in India are navigating the marketing of DTx, using qualitative insights from professionals directly involved in the industry. With pharmacy experience and management thinking, this research seeks to contribute significantly to India's digital health.

1.1 Structure of the Research

The roadmap that is adopted for the following study constitutes the following chapters:

1. Introduction: The introductory chapter of this thesis outlines the study of the effects of digital therapeutics (DTx) on pharmaceutical marketing in India. This chapter introduces the study and presents some background on DTx in the Indian context of healthcare, outlining

that rapid growth of the sector and different emergent challenges such as adopting and trusting DTx and regulatory issues. The chapter explains the relevance of the research itself, particularly in the context of India's changing digital health policy landscape, such as the Ayushman Bharat Digital Mission, and the global shift towards value-based care. The research problem, aims and objectives are defined with a focus on how pharmaceutical companies, digital health developers, and pharmacists are changing marketing strategies with reference to DTx usage in patient care. Consequently, by framing the research in the relevant context of India and outlining developments in the integration of healthcare and technologies, it offers the audience commands for the research and outlines the impacts on the research.

2. Literature Review: This chapter presents the literature reference to all academic and industry research that is relevant to digital therapeutics (DTx) and the role of pharmaceutical marketing in India. A review of studies from both global and local sources is provided to not only understand how DTx, is defined, regulated, and utilized, but in discovering the marketing approach taken in like industries in healthcare technology. This review is also focused on providing discussion on the components of the research problem and research questions introduced in Chapter 1, such as trust, regulatory readiness, and patient engagement. This chapter also includes a conceptual framework which is further used to support the study, and it also helps to fill the research gap.

3. Methodology: This chapter provides the specifics of the research design that was conducted to study the effects of DTx on the pharmaceutical marketing approach in India. The chapter describes the chosen qualitative method used by conducting semi-structured interviews with various professionals (pharmaceutical marketers, product managers, pharmacists, and DTx developers). The methodology section describes the sampling method (or sampling strategy), how the data collection took place, and the thematic analysis framework (Braun and Clarke, 2006) used to interpret the results. Issues related to validity, reliability, and ethical, are highlighted along with a justification for the methods in relation to the Indian healthcare and technology context.

4. Results: The findings from the interviews through thematic analysis are presented in this chapter, summarising several common themes including trust development, regulations supporting or inhibiting DTx, patient engagement metrics, bundling, and differences

between rural-urban DTx adoption. These findings give concrete evidence showing how DTx is transforming marketing priorities in India's pharmaceutical sector, shifting away from prescription volume metrics to patient engagement and value-based care outcomes.

5. Discussion: This chapter contextualises the findings in relation to existing literature and theoretical frameworks and contrasts and compares the views of Indian pharmaceutical stakeholders with patterns identified in other markets, exploring where India's DTx adoption and DTx marketing aligns and diverges globally. The discussion also reveals the strategic implications of the findings for marketers, regulators, and providers of healthcare services.

6. Conclusion: In the last chapter, the report summarizes all the contributions of the research on DTx uptake in India, emphasizing trust, regulatory clarity, and culturally sensitive marketing and their role in driving DTx uptake in India. The chapter gives practical advice that pharmaceutical companies, policy makers, and technology developers can implement to improve the effectiveness of DTx marketing and greater uptake by patients. Additionally, the chapter also highlights possible avenues for future research, including strategies for deploying DTx in rural areas, longitudinal studies of DTx adoption, and policy comparisons with mature DTx markets.

Chapter 2: Literature Review

2.1 Introduction

Digital therapeutics (DTx), which refer to evidence-based, software-driven treatment methods designed to prevent, manage, or treat medical conditions (Digital Therapeutics Alliance, 2023). According to the Digital Therapeutics Alliance (2023), DTx undergo clinical validation and regulatory oversight, setting them apart from wellness applications. To date, the evolving integration of digital therapeutics with the pharmaceutical industry's sales and marketing practices against the backdrop of India's healthcare system. While the attention given to DTx is noteworthy in the realm of global health research, its impact on pharmaceutical marketing, particularly in the Indian context, is majorly neglected. This review analyses literature from both academia and industry concerning DTx deployment, policy frameworks, digital health promotion, consumer confidence, and the competition around pharma sales to inform policy as well as parallel auxiliary factors. It also highlights discrepancies and overlaps in existing research to establish a framework for this study's qualitative analysis of the extent to which DTx are transforming pharmaceutical marketing in India.

2.2 Understanding Digital Therapeutics: Global Definition and Scope

So far, DTx diabetes, hypertension, mental health, and substance use disorder treatment areas have significant impact as measured by clinical efficacy, regulatory approvals, and insurance reimbursement (Aarushi & Zack, 2024). In the U.S. and EU, products like Pear Therapeutics reSET for substance use disorder and Voluntis Insulia for diabetes management have received regulatory approvals as well as insurance reimbursement (Gupta & Park, 2021; OECD, 2023).

Pharmaceutical firms are now adopting DTx to broaden their services beyond the conventional "pill-for-every-ill" model. The arrival of DTx led to the emergence of new commercial models centred on data analytics, behavioural science, and patient engagement for pharmaceutical companies (Busse & Kunde, 2021). These worldwide trends establish a

wider context for examining the evolving marketing approaches of Indian pharmaceutical firms regarding DTx integration.

Whereas markets like Europe and North America, structured systems for promoting digital therapeutics have established clinical validation, reimbursement models, and connections with electronic health records (Gupta & Park, 2021). In Germany, the Digital Healthcare Act (DVG) allows licensed DTx therapies to be prescribed by healthcare practitioners and reimbursed by public insurance companies. The creation of this system provides pharmaceutical companies subsidiary conditions for marketing DTx interventions in Germany that rely on data of efficacy and institutional trust (BfArM, 2023). In contrast, India currently has no supported regulatory or reimbursement system, creatin conditions for marketing based almost exclusively on patient education, provider partnerships, and digital marketing. While the frameworks that are developing in international scenes provide valuable reference points, the structure of the Indian health care system, diverging cultural norms, and differences in digital literacy imply that localised marketing strategies are required for producing marketing campaigns. This contextual gap has emphasized our need to study DTx marketing strategies in the pharmaceutical space in India.

Subscription models and outcome-driven pricing are gaining traction in European markets as well. The German DiGA (Digitale Gesundheitsanwendungen) framework has enabled more than 40 DTx applications to secure provisional reimbursement while evidence builds as this method fosters the gathering of real-world data and allows companies to earn revenue during the evaluation stage (BfArM, 2023). These models are now encouraging pharmaceutical companies to explore hybrid solutions that combine software, devices, and medications into a complete value offering for patients.

This shift is important in the Indian context because global pharmaceutical companies often test models in developed markets prior to modifying them for emerging economies. For example, Novartis has adopted community hypertension management programs in developed markets, as they do in the developed U.S. market, while modifying the program through those medical providers that they partner within a price-sensitive context in India (Novartis Foundation, 2022). Sanofi did something similar with their oncology treatments, a collaboration with Innovent Biologics in developing their oncology treatments used in China and then later modified the pricing and distribution actions to reflect local regulations and

affordability considerations. This it is a model they are exploring for India (Contract Pharma, 2024). Identifying which models may thrive in India is crucial, especially considering regulatory constraints and pricing restrictions. Indian firms could implement value-oriented pricing, contingent reimbursement via health insurers, or subscription models linked to doctors targeted at Tier 1 cities. However, the absence of formal reimbursement policies means that these adjustments will need to rely more on B2B collaborations and less on government support initially.

2.3 DTx in India: Opportunities and Challenges

Digital therapeutics (DTx) present a unique but complex scenario in India. India is expected to become the third-largest pharmaceutical market globally by 2030, with notable growth expected in the next five to ten years (IBEF, 2024). This optimism is backed by trends in the growing usage of digital technologies, with over 800 million smartphone users in India by 2023, and national programs like the Ayushman Bharat Digital Mission (ABDM), are facilitating the development of digital health ecosystems (NITI Aayog, 2021). These trends lead to new market opportunities for pharmaceutical companies in India to merge DTx into their products and service offerings.

Difficult organizational and socio-economics challenges remain for DTx implementation in India. Successful DTx implementation will have to occur with cooperation from many healthcare providers because of the disjointed nature of India's health care delivery system. Moreover, over 65% of India's population lives in rural areas, where there is minimal digital literacy and access to basic healthcare (Gupta & Narayan, 2022). This affects the diffusion of DTx not only through awareness and behaviour change but also on the marketing side of DTx products, especially since awareness of digital health among certain populations in India is limited. In addition, DTx products need clinical validation and to establish credibility for users, and that is more difficult to achieve in India due to the absence of clear guidance/regulation specifically for digital therapeutics.

2.3.1 Regulatory Landscape for DTx in India

Although nations such as the U.S. and Germany have established routes for digital therapeutic approval, India's regulatory framework continues to be disjointed. The Central Drugs Standard Control Organization (CDSCO), India's primary pharmaceutical regulatory authority, has not yet acknowledged DTx as a separate category. Digital tools are often categorized into wellness applications or software considered as medical devices (SaMD), resulting in uncertainty about their classification, pricing, and permissible marketing methods (MeitY, 2023). This void generates uncertainty for pharmaceutical marketers, who need to manage vague legal and compliance matters.

The Telemedicine Practice Guidelines (2020), published by the Ministry of Health and Family Welfare in conjunction with NITI Aayog, address online consultations and digital prescriptions but do not provide clear regulations for software as a form of treatment. As a result, DTx companies often operate in an unpredictable regulatory landscape.

Sector-focused initiatives, such as the HealthTech policy consortium and the Indian Digital Health Index (IDHI), aim to advance organized frameworks. In the absence of formal regulations delaying from these initiatives, pharmaceutical firms utilize various strategies such as running trials in private healthcare environments or merging DTx services with traditional therapies (MeitY, 2023).

Regarding intellectual property and data privacy, DTx companies are required to adhere to India's Digital Personal Data Protection Act (2023), which introduces complexities in managing user consent and protecting health information, like challenges faced in other markets like the EU under the General Data Protection Regulation (GDPR) (European Union, 2016). This influences how marketers develop their user acquisition tactics, particularly concerning sensitive information like psychiatric or reproductive health results.

Consequently, regulatory voids affect not just product development but also influence the narratives and risk factors incorporated into marketing strategies (MeitY, 2023). The demand is increasing for the promotion of DTx-specific approval systems, reimbursement routes, and marketing authorizations similar to those established overseas.

2.3.2 Financing Models and Insurance Integration in DTx

A major barrier to the broad adoption of DTx is the funding of these interventions. In Western markets, paths for reimbursement greatly impact commercial success. In the

United States, Medicare and health insurance providers have started to cover DTx products through CPT and HCPCS codes when combined with behavioural therapy sessions (CMS, 2023). This allows pharmaceutical developers to set prices for DTx according to subscription frequency and engagement metrics instead of traditional pill-based methods.
Conversely, the healthcare financing scenario in India shows that around 62% of medical costs are produced directly by individuals, while private insurance encompasses less than 20% of the crowd (NITI Aayog, 2023). This significantly limits patients' ability to independently finance subscription-based DTx products. Consequently, innovative funding models are being created. Different startups, such as MFine and HealthPlix, are partnering with companies on employee wellness programs, incorporating DTx as part of workplace health spending.
Pharma companies, too, are exploring bundled financing models. For instance, Lupin's DTx–drug combination for cardiology includes subsidised access to the app as part of prescription fulfilment through select private hospitals. Similarly, ICICI Lombard's pilot program offered discounted insurance premiums to patients who maintained app engagement above a threshold which is a form of health gamification that ties financial incentives to digital adherence (Dr Reddy's & ICICI Lombard, 2021).

These packaged or employer-centric models illustrate a growing trend in which pharmaceutical companies need to consider multi-stakeholder value propositions, interacting with healthcare providers, insurers, and employers rather than concentrating only on direct consumer sales. This complicates promotion, requiring cooperation among sales teams, healthcare companies, and digital interaction sectors. It offers an opportunity for India. Although there are no established financial frameworks, creative partnerships among existing players (healthcare systems, corporate wellness programs, public health initiatives) can effectively close the gap.

2.4 Traditional vs. Digital Pharmaceutical Marketing in India

Historically, Indian pharmaceutical marketing has centred on sales representatives (medical reps), physician detailing, product sampling, and sponsorships for Continuing Medical Education (CME) (Gupta & Narayan, 2022). These approaches favour the prescriber more than the patient, depending significantly on face-to-face interaction. The rise of DTx is

transforming this framework. In contrast to traditional medications, DTx solutions typically focus on patients and rely on heightened engagement, immediate feedback, and encouragement for behaviour modification such as factors that demand direct-to-consumer (DTC) digital marketing approaches. Apps such as Practo, 1mg (currently Tata 1mg), and MFine are driving these transformations by offering health services, diagnostics, and online pharmacy solutions.

What sets DTx marketing apart includes living user interactions, interacting digital touchpoints, and customized user journeys through intervention-based platforms, while still maintaining traditional factors of clinical efficacy as in standard pharmaceuticals. Remember, however, DTx products are entirely dependent upon patient acceptance and adherence using the software or app. Therefore, user experience and trust within the digital platform are key concerns. For example, Wellthy Therapeutics, has a diabetes management program employing behavioural nudges, coupled with AI-based personalization, and, therefore, successful marketing involved utilizing alternative techniques, apart from standard brand advertisement (Wellthy Therapeutics, 2022). Similar trends have been found in DTx marketing in other environments, such as the United States. Pear Therapeutics, who had an app called reSET targeting substance use disorder, encountered challenges with user success because their onboarding procedures were long and complicated, thus complicated their onboarding process to use the app, and they were able to do some short marketing campaigns to streamline onboarding process, and re-establish trust (Dang et al, 2020). In the EU, DTx developers who have launched products, such as Kaia Health with their chronic pain management app, have encountered complications with allowing older populations to engage with their product due to low digital literacy levels, thus requiring crafting marketing plans pertinent to the context of how to market accessibility and learning (Kaia Health, 2023). These examples illustrate that trust and engagement in DTx is a global concern, and advertisers and marketers will need to employ contextual marketing plans respectively.

Nevertheless, academic papers often combine DTx with broader digital health or telemedicine strategies. Sharma and Sharma (2021) studies the digital health marketing trends in India, finding social media campaigns and influencer engagement significantly boost consumers' interaction and awareness of digital health alternatives. Sharma and Sharma (2021) did not look at regulatory or clinical details regarding use of digital

therapeutics (DTx) using DTx point-of-departure for adherence to Central Drugs Standard Control Organization (CDSCO) limits, clinical validation and regulatory adherence. Their omission shows the importance of marketing research for DTx, focusing on strategy in a regulated healthcare environment unique to India.

2.5 Consumer Trust and Cultural Sensitivity in DTx Adoption

Trust plays a vital role in the acceptance of DTx among consumers, particularly in culturally diverse and economically varied nations such as India. A study by Busse & Kunde, (2021), indicates that Indian users are more inclined to embrace DTx with physician endorsement, regulatory support, and assurance of data privacy.

Stigma, particularly related to mental health and sexual health, also influences the uptake of DTx. Mental health apps like Inner Hour have seen limited adoption in Tier II and III cities, mainly because of low awareness and cultural opposition (Gupta & Narayan, 2022). Marketing strategies must therefore incorporate culturally sensitive messaging, vernacular content, and partnerships with local health influencers or community-based organizations.

Moreover, socio-economic imbalance in digital literacy requires adaptive marketing. For example, urban consumers might respond well to app-based health tracking, while rural users may need WhatsApp-based engagement or hybrid models that involve frontline health workers (Gupta & Narayan, 2022). Although global DTx marketers use influencer endorsements and patient success stories, these methods may not be as effective in India without contextual localization, an area where research is still limited.

2.5.1 Role of Healthcare Providers in DTx Adoption

Healthcare providers in India play a vital role in the deployment of digital therapeutics. Unlike consumer health apps that people typically start using on their own, the use of DTx is often supported by healthcare providers who integrate these tools into the comprehensive treatment strategy. This demonstrates the need for a more physician-centric approach to pharmaceutical marketing instead of a patient-centric approach. A survey of 400 urban general practitioners in 2022 by Armeni, & Vejlgaard (2024) revealed that most peoples would be open to adopting a DTx solution that was clinically proven and followed

observational protocols.

Nonetheless, the same study showed a significant unawareness, with very few identifying specific DTx products (Armeni, P., Krebs, L., Vejlgaard, T., & et al., 2024). This suggests that trust and reliability from the medical sector are crucial for widespread acceptance. Marketing aimed at doctors in the DTx field includes Continuing Medical Education (CME) programs, joint webinars, and the release of clinical findings in peer-reviewed publications to build trust. Digital platforms like MedTalks and Docplexus are increasingly being used for this form of dissemination. Moreover, numerous pharmaceutical firms are incorporating DTx into electronic prescription workflows, allowing doctors to offer patients an app alongside a traditional medication. This type of integrated marketing guarantees that doctors become collaborators in the engagement process, thus enhancing adherence and clinical results which is necessary component of the DTx business model. For India, where healthcare is highly decentralized, such alignment can be the deciding factor in whether a DTx product scales successfully.

2.5.2 Patient Personas and Segmentation in Indian DTx Marketing

Effective DTx marketing depends increasingly on understanding user personas and segmenting the target audience where the strategies are common in consumer technology but relatively new in pharmaceutical marketing. In advanced DTx markets, segmentation encompasses not only medical conditions but also demographics, psychographics, and technology skills. For example, Headspace aims at younger, tech-savvy individuals with mindfulness content, whereas mySugr (now part of Roche) caters to older diabetic users by offering straightforward interfaces and insulin-tracking features (Headspace Research Team, 2024).

In India, segmentation takes on an even more complex form owing to extensive socio-economic diversity. For instance, an application such as Wellthy Therapeutics needs to accommodate both English-speaking urban diabetics and Gujarati-speaking rural seniors, which requires varying UI language choices, literacy-level content, and navigation pathways within the app. Mobile brand engagement companies such as Kalaari Capital advise that DTx products should create distinct onboarding processes for urban/educated and

rural/uneducated user groups. Each featuring tailored tutorials, language proficiency, and communication intervals (Kalaari Capital, 2021).

Healthcare startups are increasingly using user data to refine these segments. PhableCare, for example, analyses usage patterns to distinguish “tech-savvy, self-directed users” from “clinically guided users” who require regular reminders and verification from providers. Each persona receives customized push notifications, health content, and progression dashboards (Canvas Business Model). This focused engagement corresponds with personalized marketing but necessitates collaboration between product teams and marketers to exchange real-time analytics and perform consumer research in an ongoing manner. In the absence of focused messaging, user interface elements, and localized assistance, DTx products face the threat of poor adoption, particularly within vulnerable or digitally reluctant demographics. This method further sets DTx apart from traditional pharmaceuticals, where marketing is typically uniform and centred on prescribers.

2.6 Competitive Dynamics and Strategic Shifts in Marketing

The rise of DTx introduces fresh competition for pharmaceutical firms in India. Traditional pharmaceutical companies encounter rivalry not just among themselves but also from digital startups, technology-based health platforms, and insurance companies offering preventive digital therapeutics solutions.

As a result, marketing strategies are evolving. Some pharmaceutical firms are forming strategic alliances with health technology companies. In 2022, Lupin Digital Health collaborated with Aptar Digital Health to develop a cohesive ecosystem for cardiology care, combining pharmaceuticals with prompt digital support (Lupin, 2022). These efforts signify a shift from a "product-first" approach to a "solution-first" mindset.

Branding in DTx also emphasizes user-friendliness, openness, and continual involvement. The "four Ps" of marketing are product, price, place, promotion which take on various meanings in the DTx context. The product evolves into a service-oriented, growth-focused app experience, pricing may incorporate subscriptions, bundled offers, or payments tied to outcomes, transition services to online platforms, app stores, and telehealth networks and progress emphasizes clinical outcomes, peer validation, and confidence in digital platforms.

These adjustments necessitate updated marketing frameworks and evaluations, such as engagement rates, compliance indicators, and clinical ROI, the standards rarely incorporated in conventional pharmaceutical marketing approaches.

2.6.1 Digital Engagement Metrics and Personalization in DTx

Creating DTx products requires a significant shift from traditional pharmaceutical key performance indicators (KPIs) like prescription volumes and geographic coverage. Success in DTx is gauged by digital indicators such as app downloads, daily active users (DAUs), levels of engagement, points in the patient journey where drop-offs occur, and enhancements in results over time. This necessitates pharmaceutical marketers to work together with digital analytics teams, a trend that is still quite recent in India.

Personalization represents another crucial element of marketing for DTx. AI-powered platforms like Wellthy Therapeutics and PhableCare provide tailored prompts informed by user data, including glucose levels, mental health, or adherence to medication (Wellthy Therapeutics, 2022). The level of customization here is so high that there is an opportunity for adaptive marketing. Marketing communications could change based on the user's actions over time. For instance, if the user records meals regularly but does not record exercise, the application would push a notification that would prompt them to record their exercise efforts.

In contrast, conventional marketing has rarely achieved this level of real-time behaviour tracking. Marketers in India need to be proficient in digital marketing, knowledgeable about data privacy regulations, and emphasize continuous engagement instead of seeking immediate conversions. In assessing a campaign's effectiveness, tools like cohort analysis and retention curves are critical.

Utilizing these metrics enables marketers to demonstrate ROI not only through revenue but also through improved patient outcomes, offering a significant edge in B2B conversations with insurers or healthcare organizations. Although Indian firms are progressing in skill development in this field, global examples offer models for the future of value-driven marketing.

2.6.2 Competition from Indirect Care Channels and E-Pharmacies

While direct-to-consumer (DTC) DTx is gaining momentum, indirect competition from e-pharmacies, telemedicine platforms, and wellness marketplaces significantly influences user pathways. In India, platforms like Tata 1mg, Practo, NetMeds, and PharmEasy provide integrated services such as doctor consultations, medicine delivery, lab tests, and occasionally, wellness modules. These platforms have the potential to compete with DTx stands-alone firms by integrating clinical care with pharmaceutical care. For example, PharmEasy recently piloted a diabetes management module that would offer education and medication reminders through the app prior to the emergence of actual DTx offerings. Similarly, MFine has developed partnerships where selected DTx apps are embedded in subscription-based clinic packages. This accelerating creates network effects by which users drawn to e-pharmacy or telemedicine services may organically encounter DTx functionalities, influencing their value perception and adoption behaviour.

From a marketing standpoint, pharmaceutical companies must now decide whether to launch independent DTx products or seek partnerships with these platforms. With co-branding agreements, white label strategies, and API partnership agreements becoming crucial to marketing strategy. Partnering with a leading e-pharmacy platform will have complexities with revenue sharing models and compliance (especially given data privacy and medical guidance regulations).

Moreover, e-pharmacies have increased their penetration into Tier II/III cities which gives them an upper hand with their marketing infrastructure. For a pharmaceutical company, partnering with these platforms may offer a faster route to expansion than creating separate digital channels. Recognizing this shift, some Indian pharmaceutical firms are investing in hybrid marketing approaches by attracting users through platform bundles supported by convincing physicians and providers.

2.7 Research Gaps and Conceptual Framework

While digital therapeutics have gained grip worldwide, most published studies focus on their clinical applications or the regulatory development in westernized markets like the United States and Europe (for example, studies in the U.S. will often discuss FDA-approved DTx

products, insurance models for patients, or organizations using DTx within an electronic health record), or focus on how digital therapeutics could be accommodated in the public health systems of various European countries along with focused policy and regulation to support them.

Unfortunately, these developments and perspectives do not directly import to the healthcare environment in India suffering from its own unique infrastructure challenges, fragmentation of health provision, and varying levels of digital literacy. In decidedly 'western' healthcare systems there are centralized systems, particularly in public healthcare systems but also in private systems, while India has a unique pharmaceutical landscape, consisting of multiple public and private players, different market segments of consumers, and increasingly sophisticated digital regulation.

As such, it may be time to employ India-focused research studies which begin documenting how pharmaceutical developers, such as DTx companies, consider marketing and sales of DTx in India. This is critical in the case of DTx solutions because end-user engagement is a central pillar of product effectiveness and its acceptance in the market. The traditional marketing concept of the 4Ps (Product, Price, Place, and Promotion) is also taken and re-considered adapted to represent DTx solutions' digital and patient-centric focus, this study is guided by the following research question: “What, if any, changes are digital therapeutics making to the marketing and sales paradigm in India’s pharmaceutical industry?"

Chapter 3– Research Methodology

3.1 Introduction

This chapter outlines the methodological framework used to examine the impact of digital therapeutics on the sales and marketing approaches in India's pharmaceutical sector. The main research question: How, if at all, are digital therapeutics influencing sales and marketing strategies in India's pharmaceutical sector? requires an in-depth examination of industry practices, viewpoints of professionals, and relevant challenges. Given the evolving and dynamic environment of DTx in India, a qualitative approach was deemed the best option to obtain detailed, nuanced insights into marketing adaptations, regulatory obstacles, and consumer trust factors. This approach aligns with the need to understand complex, context-specific phenomena rather than assessing broad trends, which would be premature in a market where DTx is still evolving. In total, seven semi-structured interviews were conducted with the pharmaceutical and digital health industries representatives in India comprised of two pharmaceutical marketers, one DTx developer, one executive for product development, and three retail pharmacists based on their experience and expertise of marketing and distribution.

Data was analysed thematically to summarize key findings around the marketing of DTx. The approach is based on recognized qualitative research principles, highlighting adaptability to incorporate various perspectives from pharmaceutical marketers, DTx developers, healthcare providers, and consultants. This chapter is organized to give a transparent outline of the research process, addressing philosophical stance, research methodology, design, data gathering techniques, sampling approach, data analysis methods, ethical issues, and constraints. The chapter places the methodological choices within the Indian pharmaceutical and digital health industries, connecting them to earlier studies like Choudhury et al. (2023) and Sharma & Gupta (2022).

3.2 Research Philosophy

The philosophy of research influences the beliefs regarding knowledge and reality that form the foundation of the study Saunders and Kingstone (2017). This research embraces an interpretivist philosophy, which asserts that reality is constructed socially and can be best

comprehended through the individual experiences and viewpoints of participants. Reflecting the overlapping cultural, regulatory, and technological factors surrounding DTx marketing in India, interpretivism is an appropriate means of studying the complexity and diversity within it, with vastly different views on digital health technologies shaped by different levels of digital literacy, and cultural views on technology, in urban and rural India (Gupta & Narayan, 2022). An interpretivist perspective enables the researcher to explore this delicacy by emphasizing the personal experiences and contextual understanding of participants rather than focusing on objective and universal facts.

Alternative philosophies, including positivism, were evaluated but considered unsuitable. Positivism depends on measurable, objective data and testing hypotheses, portraying it more appropriates for extensive surveys or experimental methods. In DTx marketing, the unclear regulatory guidelines from the Central Drugs Standard Control Organization (CDSCO), along with changing market practices, result in positivism lacking the depth and context required to tackle the research question. The interpretivist viewpoint aligns with prior DTx studies in emerging markets, such as Choudhury et al. (2023), which utilized interpretivism to explore cultural influences on digital health acceptance in India, and Dang et al. (2020), who examined international DTx marketing trends using qualitative methodologies.

3.3 Research Approach

The research uses an inductive method, focusing on generating broader themes and patterns from specific observations like interview data, instead of deductively testing established theories. This method aligns well with the exploratory aspect of the research, enabling emerging insights into DTx marketing strategies to appear naturally. Inductive reasoning, for instance, can reveal surprising outcomes, like the influence of cultural stigma on the uptake of mental health digital therapeutics or the effect of regulatory ambiguity on promotional strategies (Sharma & Gupta, 2022). The study begins with professionals' narratives, establishing a grounded comprehension of how pharmaceutical companies adjust to DTx, which is essential due to the poor theoretical frameworks existing for India's DTx market.

This inductive methodology is valuable for the Indian context where the DTx landscape is still developing, and it considers a complex socio-economic and regulatory environment. The study describes the participants lived experiences and provides specific illustrations of how they frame marketing-related constructs that have been commonly undertaken to mitigate the challenges of the Indian health ecosystem, such as low digital health literacy levels (Kapoor & Patel, 2022), fragmented healthcare systems, and diverse patient needs. For example, there is DTx literature (Gupta & Narayan, 2022), across the globe that acknowledges the existence of inductive reasoning by acknowledging that pharmaceutical marketers have user experience in messaging to patients in rural and urban marketing campaigns as well as their own unique first-order sentiment when participating in mobile user interface designs, which has often gone unnoticed. That relates to marketing context adaptations, positioning vernacular languages in app-based marketing, and figuring out just how to establish consumers' trust considering India's Digital Personal Data Protection Act, 2023. Overall, analysis of primary data situates the analysis specifically in the context and subsequently builds a theoretical perspective on DTx in India which contributes to literature and aids in any future development of either policy or practice.

3.4 Research Design

The research employs a qualitative exploratory method, suitable for inquiries concerning "how" and "why" in less-studied areas in India such as DTx marketing. Exploratory designs enable the author to examine evolving practices, including how pharmaceutical firms plan to utilize social media for promoting DTx in the future, despite regulatory concerns, and how they build consumer trust in digital solutions. This framework enhances an extensive understanding of marketing changes, participants' challenges, and competitive dynamics, which are crucial because of India's fragmented healthcare and regulatory landscape. Alternative designs, such as descriptive or explanatory methods, were evaluated but deemed unsuitable. Descriptive designs focus on detailing phenomena rather than investigating underlying factors, which would inadequately address the complex marketing challenges posed by DTx. Explanatory designs aim to uncover causal relationships, but establishing causation (e.g., DTx resulting in increased sales) is premature in India's market, where vital data on DTx adoption is limited. Case study approaches were regarded as

appropriate for in-depth evaluations of specific companies. Nonetheless, they were overlooked in favour of cross-sectional interviews to gather broader perspectives from the industry. This research approach aligns with previous investigations, such as those by Dang et al. (2020), who applied qualitative methods to analyse global DTx marketing trends, and Choudhury et al. (2023), who assessed consumer readiness for digital health in India.
The data collection for the research primarily involved semi-structured interviews conducted via WhatsApp calls to accommodate the participants' locations and schedules in July 2025. The interviews lasted from 7 and 12 minutes, have been recorded with strong consent, and were transcribed intact for later analysis.

WhatsApp accessibility, particularly for busy professionals, made quick questions to deal with complicated subjects like regulatory uncertainty or cultural barriers to DTx uptake much smoother.

3.5 Sampling and Sample Details

Purposive sampling, a non-random approach, was employed to select participants with direct expertise in DTx marketing, ensuring alignment with the research question (Palinkas et al., 2015). This approach concentrates on "information-rich" instances, encompassing specialists involved in pharmaceutical marketing, DTx development, or healthcare delivery, who can provide insights on strategies for promoting resources like diabetes or mental health applications. Purposive sampling was adopted in place of random sampling because it enabled significance and richness to be highlighted while applying the unique dimensions of the DTx context in the Indian pharmaceutical industry.

The sample comprised seven individuals, totalling a cross section of roles in India's urban pharmaceutical and digital health sectors. Two from leading pharmaceutical firms, marketers, presenting perspectives on traditional and DTx-integrated marketing strategies, representative from DTx company articulating some insights with product development and market access s. A product manager from a chemical company, offering a strategic view in integrating DTx. Finally, three pharmacists, providing perspectives on advancing DTx in retail. The range of participants informed the selection in terms of representing multi-stakeholder perspectives, while allowing for a more solid understanding of marketing issues

and opportunities. General consumers were excluded to focus on expert perspectives about sales and marketing strategies, since consumer opinions are considered less significant than industry practices in this study. Rural participants were omitted due to logistical issues and a lack of DTx access in rural areas, though interview questions examined urban-rural diverse to indirectly tackle this gap**.**

Recruitment occurred through LinkedIn and professional networks, where initial connections resulted in snowball sampling to find more participants. Data saturation was reached after seven interviews, as persistent themes like regulatory uncertainty, digital trust, and physician endorsement appeared consistently, suggesting adequate depth for analysis. This sample size adheres to qualitative research standards for exploratory studies, where 6–12 participants are typically adequate for achieving thematic saturation (Saunders, B., Sim, J., Kingstone, T., et al., 2017). The methodology reflects sampling techniques in comparable research, like Choudhury et al. (2023), who selected 10 specialists to investigate digital health implementation in India.

3.6 Research Instrument and Data Collection

The primary research approach involved semi-structured interviews, where each participant responded to the same ten open-ended questions. The inquiries were crafted to evaluate DTx marketing approaches, trust elements, regulatory factors, and competitive landscape. Open-ended questions enabled every participant to share their individual experiences related to DTx marketing, ensuring uniformity across the interviews.

The schedule was refined through pilot testing with a pharmaceutical marketing consultant to ensure clarity and relevance, with adjustments made to address various challenges such as government guidelines, DTx growth potential, etc. Probes like “What are the differences between urban and rural markets?” were utilized to gather more in-depth insights. The semi-structured approach offered a mix of structure and flexibility, enabling the researcher to explore unforeseen themes, such as the importance of local elements in DTx marketing. Interviews were conducted online via WhatsApp from July 5 to July 27, 2025, in English and Hindi, to accommodate participants' schedules and geographical diversity. Every interview took 9– 12 minutes. WhatsApp enabled immediate engagement and relationship-building,

essential for addressing sensitive issues such as regulatory compliance or cultural obstacles. The full interview schedule is provided in Appendix A. The online format also matched the digital emphasis of DTx, showcasing the sector's dependence on internet-based platforms. This method corresponds with qualitative data gathering in healthcare marketing research, like Sharma & Gupta (2022), who employed semi-structured interviews to investigate digital health trends in India.

3.7 Data Analysis

The data from the interviews were examined using thematic analysis, adhering to the six-phase framework established by Saunders and Kingstone (2017). This approach facilitated a structured but flexible examination of patterns in the qualitative information. The process began with familiarization, which involved reading and rereading transcripts to fully understand the stories of the participants. This thorough examination revealed extensive insights and consistent trends. Subsequently, early codes were developed by highlighting important text elements like references to "regulatory delays" or expressions about building digital trust. In the third phase, the codes were systematically grouped into broader themes like "approaches to fostering trust" and "interactions within competitive markets," underscoring crucial focus areas and possibilities in DTx marketing.

The themes were later reviewed and refined to guarantee they were consistent and closely linked to the research question. Some overlapping concepts were combined, while others were adjusted to better reflect the experiences of the participants. Once the themes were clearly outlined, the fifth step involved assigning them concise and impactful labels such as labelling a theme that encapsulated industry concerns about policy uncertainty as "Regulatory Barriers to DTx Marketing". In the final phase, the themes were linked into a unified story, supported by direct quotes from participants to emphasize key ideas and maintain the authenticity of their perspectives.

Alternative analytical methods, such as content analysis (quantifying word frequencies) or discourse analysis (examining language power dynamics), were considered but rejected. Content analysis prioritizes frequency over depth, which would limit insights into complex marketing strategies. Discourse analysis focuses on linguistic structures rather than practical

industry insights. Thematic analysis was chosen for its flexibility and alignment with exploratory studies, as seen in Gupta & Narayan (2022), who thematically analysed barriers to mental health app adoption in India.

3.8 Ethical Considerations

This study followed ethical guidance, as provided by the British Educational Research Association (BERA, 2018), with participant well-being and research ethics in mind. Participants received information sheets outlining the purpose of the study, obligation-free participation, and protocols for confidentiality of their data. Each participant was given a consent form to sign prior to the interviews being conducted. Before starting the interviews, participants were made clear that they were free to withdraw from the study at any point in time and that this would never affect them negatively. Participants were given a pseudonym to ensure anonymity (e.g. Participant 1), adhering to India's Digital Personal Data Protection Act (2023). Participants received transcripts for member-checking to verify accuracy and ensure their perspectives were accurately represented.

No formally collected sources of potentially sensitive personal data (e.g., health-related records) were obtained, which maintained a low level of risk. This research received ethical approval from the Ethics Committee of the National College of Ireland to ensure compliance with their institutional standards. Ethical measures were particularly essential due to the delicate nature of DTx marketing and the conversations surrounding health data and regulations. This method aligns with ethical principles found in comparable studies (Example: Choudhury et al., 2023), which navigate ethical challenges in digital health research by ensuring participant anonymity.

3.9 Limitations

The qualitative aspect of this research restricts its generalizability since the results represent the views of seven urban participants, potentially failing to represent rural experiences, where digital literacy and DTx uptake are lesser (Gupta & Narayan, 2022). To address this, interview questions explored differences between urban and rural areas but obtaining direct feedback from rural locations was challenging due to access limitations. Data shared

by individuals can lead to bias, as respondents might highlight effective strategies while minimizing difficulties. Examining viewpoints from various roles (marketers, clinicians, consultants) contributed to mitigating this bias via triangulation.

Utilizing WhatsApp for remote interviews might restrict non-verbal signals, which could influence the richness of responses. However, relationship-building strategies (like conversational prompts) assisted in mitigating this effect. Time constraints restricted prolonged follow-up, suggesting that results are cross-sectional and do not capture the development of DTx marketing strategies post-launch. This study also lacked explicit involvement from governing bodies like the CDSCO which may have clarified the impact of policies even further. Future research could explore methods and conduct surveys to enhance evaluations, rural sampling (to facilitate access to better representation of digital disparities), or engage with policymakers to reflect on the regulatory viewpoint.

Despite these constraints, the rigor of the methodology via piloting, thematic analysis, peer validation, and ethical protections, guarantees credible and contextually applicable outcomes. The research offers a solid basis for grasping the changes in DTx marketing within India's pharmaceutical sector, adding value to academic resources and real-world industry approaches.

Chapter 4: Findings

This chapter provides an in-depth and thematic analysis of the data collected from seven semi-structured interviews involving individuals in the pharmaceutical and digital health industries in India. The team included pharmaceutical marketers, a digital therapeutics (DTx) developer, a product manager, and three retail pharmacists. The thematic analysis follows Braun and Clarke's (2006) six-step framework and addresses the study's core objective which is understanding how digital therapeutics (DTx) are influencing pharmaceutical marketing strategies in India. All interviews were audio-recorded with consent, transcribed verbatim, and analysed manually to identify recurring themes.

4.1 Overview of Participants

The variety in participants provided a multi-stakeholder perspective. Two senior marketing professionals shared their DTx strategy at the level of large pharmaceutical companies. A product development executive shared the digital side of DTx. Marketing manager underscored the strategic commonality between DTx as a product, and chemical products supporting health. Three pharmacists from urban India discussed customer perceptions and challenges and opportunities at the retail level, at the ground level. This spread enabled a comprehensive perspective on DTx, marketing innovation and user behaviour, in urban and semi-urban contexts.

Participant Code	Designation	Area of Expertise
P1	Marketing Executive	Pharmaceutical Marketing
P2	Marketing Manager	Marketing KPIs
P3	Product Development Manager	AI-driven Customisation, User Engagement
P4	Product Manager	Bundling Strategies, Data Privacy
P5	Pharmacist	Patient Education, DTx Awareness
P6	Pharmacist	Trust-building, Rural Challenges

P7	Pharmacist	Pharmacist's Role in DTx, Regulatory Confusion

Table 1: Participant Profile Overview

4.2 Theme 1: Marketing Adaptation and Strategy Shift

A key finding from the inductive analysis of the seven semi-structured interviews was the change occurring in marketing practice in pharmaceutical and health-tech marketing practice. The interviewees (pharmaceutical marketers, a DTx developer and retail pharmacists), identified a trend to move away from physician-centred marketing to pro-active, patient-centred marketing using various digital channels. The user-centeredness that is necessary for market adoption of DTx, is shifting away from traditional marketing methods and toward a direct-to-consumer reach. This is certainly consistent with broader trends described in the Sharma & Gupta, (2022), but this theme was developed from the lived experiences of local representatives who spoke about how difficult it is to change marketing practice to accommodate the healthcare system at a local level and the rapidly changing digital landscape across India.

A marketing specialist noted that the firm is transitioning from physician-focused to patient-focused marketing with DTx, employing apps to directly engage users. Likewise, another speaker emphasized that digital therapeutics are transforming the measurement of marketing success, declaring that DTx forces us to reconsider KPIs since app engagement metrics have become as crucial as prescription amounts. Indian pharmaceutical industry is gradually moving from a transactional model to one focused on sustainable value generation. Supporting this change, participants emphasized the growing use of tools such as mobile apps, WhatsApp consultations, and AI-based reminder systems to improve user engagement.

In the context of digital-first companies, the representative from DTx company told a story of a shift in marketing from promotion of the product to objectives regarding potential behaviour change. He mentioned, when marketing DTx, we are showcasing attributes like habit tracking and even outcomes, we are not only talking about product benefits. Further, the product manager from a chemical company described how their structure is different by

integrating DTx with other chemical offerings, as he suggests they are part of a holistic patient offering.

In short, across all participant's, marketing strategy is shifting from the traditional promotion to patient education. Telling a successful story to payers, providers and patients now means sharing the value of DTx in the context of insights, experiences or health outcomes.

4.3 Theme 2: Trust as a Foundation for DTx Adoption

A common concern raised across all types of participant groups was the need to create trust among patients for any digital therapeutics (DTx) to be adopted. Regardless of the comment by the pharmacist, marketing, or digital developer, trust was very important and would be the biggest barrier to come in the future of DTx usage. This focus on trust is a sharp contrast to those working within the traditional pharmaceutical landscape, where trust is developed from long-standing brand recognition, physician prescribing behaviour, and regulatory knowledge for both providers and patients. In contrast, DTx is therapy software, is uncertain in terms of regulatory guidance, and totally lacks the drug-like characteristics that would allow users and patients to establish trust more easily before ever using the therapy solution, unlike pharmaceutical drugs, which can be trusted to have similar benefits and or weights assigned to almost identical formulations, DTx in some cases must establish trust from the ground up, relying solely on their therapeutic interventions as a foundation.

Pharmacists specified that trust in DTx could be gained through pharmaceutical approval from doctors. As an example, one pharmacist mentioned, "patients trust DTx more when we explain it with their normal meds". Another pharmacist remarked, "if the doctor says the app, the patients listen, if we tell them, they will assume it is optionally". Both comments were consistent with Adjekum (2018), as it was mentioned frequent recommendations from health care professionals would ultimately create trust in digital health tool for patients.

Within the context of the mention of the doctors' approval, participants were explicit in defining the importance of data privacy and an explicitly stated understanding of data usage. For instance, a product manager from a chemical company mentioned, "we make sure the app says how it keeps data safe, like with simple pop ups". This last point was

consistent with India's Digital Personal Data Protection Act, (2023) which highlighted the need for clarity regarding data use and consent protocols for patients. From a product development aspect, the DTx representative conveyed the importance of real-world clinical evidence in developing trust.

In conclusion, the interviews indicate that trust formation in DTx relies on three vital foundations: clinical validation, endorsement by healthcare providers, and clear data practices.

Tackling these aspects is essential for overcoming boosting patient involvement with digital therapies in the Indian.

4.4 Theme 3: Bundling DTx with Traditional Products

One significant and consistent insight across several interviews, was the planned approach to our bundling of digital therapeutics (DTx) solutions alongside traditional pharmaceutical products, both to uptake patient adherence and simplify the adoption process. Both marketers and pharmacists discussed bundling as an effective approach to introduce DTx to the general healthcare system in India.

Marketing representatives from leading pharmaceutical companies explained the DTx app's proposed use alongside traditional medications provided a stronger value proposition especially for institutional buyers like hospitals, and larger clinics. Marketing representative explained, bundling DTx with our existing drugs will make the offering more attractive to hospitals. This, was believed, likely increases acceptance by providers who are familiar with the brand and the pharmaceutical offering.

In this case, the chemical product manager explained that bundled treatment with the app offered a sensible, relatable way to introduce patients to new digital tools, "Here's your inhaler, and an app to help it work better." Patients were open to technology when it was seen as a part of treatment then and not as a disruptive stand-alone invention. Further, the he explained that, to the patients, the app was part of medicine, it would therefore part of their traditional care package.

DTx is frequently a form of adherence support device and reassurance device in bundled solutions, through reminders, patient progress and educational reminders used in them.

When the DTx can take some of the burden off of medication routines and fit into the patient's daily routine, it generally makes it simpler for the patient to follow their treatment plan. Further, if the DTx is combined with a trusted medication brand, the connection to technology feels even more secure because it is thought of as a piece of one's prescribed care and is not particularly seen as additional new or experimental technology.

Pharmacists shared this perspective from the front lines of healthcare delivery. For example, a pharmacist, noted that including digital applications with the medicine itself eliminated uncertainty and supports patient trust. “When the app comes with their meds (essentially a free add-on), they’re going to try it.” This approach seemed to reduce resistance for patients who see mobile health applications in both sceptical, and, as battery drainers, examples of unnecessary additional burden.

Following a theoretical perspective, this practice is consistent with the conclusions of product-service bundling in healthcare can improve therapeutic outcomes and can also develop brand loyalty. For DTx, bundling represents an opportunity to normalize the use of DTx by viewing it as just a natural part of the overall treatment experience, because if a patient sees technology framed as improving the efficacy of their existing treatment, they are more likely to use it. Apart from the marketing benefits, bundling may have a communicative benefit, allowing both pharmacists and physicians to explain the 'why' of using the app without requiring a lot of discussion. It also indirectly encouraged physicians to mention the app in consultations, which helped the app to gain legitimacy.

In conclusion, bundling DTx with traditional medications represented a complex tactic to not only improve marketability but also support user, plant confidence, and help in establishing DTx as a part of standard care in the standard treatment pathway.

4.5 Theme 4: Personalisation and User Engagement

One of the key theme for all seven interviews was the significance of personalisation contributing to sustained user engagement with digital therapeutics (DTx). This was especially highlighted by participants who work directly with end users, inclusive of pharmacists and product developers.

Pharmacists said that patients will continue using DTx apps when those apps are personal to

their habits, language, and health goals. A pharmacist noted, “patients like apps that feel like they’re made for them,” while another pharmacist explained, “personal stuff, like diet tips in their language or reminders at the right time, makes them feel the app is for them.” These perspectives point to the emotional connection and sense of ownership that personalised DTx tools can foster among users.

There was also an agreement from the perspective of the developer. A representative from DTx company said that, their platform uses AI and tracks individual health trends, med compliance and behaviour triggers to deliver content that the user understands is relevant and can act upon.

These findings have resonance with the rising idea of digital empathy such as the capacity for digital health solutions to adjust to the clinical requirement as well as the cultural, language, and behavioural context of an individual. This supports a view by Abou Hashish (2025) that healthcare applications must reflect the user's experience and respond in real time to the user's behaviours. In a country like India where there is huge diversity in socio-cultural and digital literacy, digital empathy is not just a value-add for digital health solutions but a strategic imperative.

In addition, the interviews also revealed that ease of use and accessibility are important enablers of personalisation. Representatives spoke about intentionally designing user interface (UI) simplicity, as well as vernacular languages supporting users. Also, the timing and format of communication emerged as important factors in keeping users engaged. Many pharmacists explained how patients reacted positively to timeliness i.e. reminders shortly after meals or visual feedback about progress. These can all be thought of as micro-interactions that establish healthy habits and a companionship between the application and user. However, despite these developments, participants also reported challenges related to scalability. Personalising behaviour change requires data, algorithm refinement, and feedback, which require significant resources and infrastructure. Also, as new data protection laws emerge in India, the ability to personalize while not breaching user privacy continues to be that balancing act that health apps struggle to maintain.

In summary, the interviews highlighted that effective DTx solutions in India must go beyond generic, one-size-fits-all approaches. Instead, success depends on platforms that are natural, behaviourally responsive, culturally aware, and linguistically inclusive. By integrating

personalisation at the core of app design and communication, DTx providers can foster deeper trust, improve adherence, and enhance long-term health outcomes among diverse user groups.

4.6 Theme 5: The Role of Pharmacists as DTx Enablers

A significant and somewhat unforeseen outcome from the interviews was the emergence of pharmacists as increasing awareness and facilitation around digital therapeutics (DTx) in the healthcare ecosystem of India. Historically, since there were no previous marketing efforts for pharmacists as a profession, and they have typically been relegated to dispensing roles in the marketing avenues of the pharmaceutical industry, pharmacists are increasingly being seen as were at the forefront of the pharmacy industry and they can introduce the utility of DTx applications to patients at their routine interactions. Several participants discussed this change in pharmacist participation. For example, a pharmacist said, we can say that 'this app helps you track your meds', while giving them their prescriptions. This comment reveals the belief of pharmacists is not only dispensing medications but acting as interfaces to digital health literacy. Pharmacists often receive questions from patients, especially in situations where it is not possible for doctors to explain DTx and there is often a lack of time or context to explain everything about the DTx tools.

Pharmaceutical marketers equally recognized that pharmacists were increasingly strategically involved in spreading DTx information. For example, a marketing representative stated, pharmacists are now key factors for more effectively explaining DTx to patients at the counter. In other words, pharmacists are not seen as a channel in the overall communication and engagement strategy for DTx incorporation. While this emerging function was identified, the interviews illustrated a significant limitation in what pharmacists could actively promote or educate patients about regarding DTx. This was due largely to a lack of formal training and lack of regulatory direction. A pharmacist stated, “we’re not sure what we can say about the app. Like, can we call it a treatment?” With this uncertainty, not only does it limit a pharmacist’s confidence in what they are allowed to convey, but it highlights broader uncertainty in the legal status of the products and their classifications.

These findings reinforce the argument for organized training initiatives with pharmacists in mind so they can interact with DTx with evidence. Additionally, providing pharmacists with standardised communication toolkits, including approved language for explaining DTx use, QR codes, and visual aids, could further enhance their ability to support patient adoption. As trusted healthcare professionals, pharmacists are uniquely positioned to influence health behaviours, especially in community settings where doctor–patient interactions are brief or infrequent. In summary, pharmacists have never been at the centre of pharmaceutical marketing strategies, however, their established distance from patients, many times daily interactions, and credibility can help position pharmacists as DTx champions, particularly at retail.

4.7 Theme 6: Urban–Rural Divide in DTx Adoption

A marketing professional emphasized the formulation of DTx, "urban markets are more feasible with DTx where there is already digital literacy", highlighting the preference for metro cities and tier-one urban centres in their strategic indications. In their urban focus, a pharmacist noted "rural patients don't know what DTx is, urban patients at least think it is curious", identifying the absence of awareness and exposure of rural customers. However, India's active internet users live in urban areas made even more evident by the knowledge that the rural population is substantial. This suggests that the digital divide remains a significant barrier to the fair spread of health innovations such as DTx.

In regard to the barriers, some suggested strategies although these approaches were designed to account for the social-technical aspects of rural India. Suggestions included vernacular-language user interfaces, simplified and intuitive app navigation, and offline engagement strategies that would be beneficial in overcoming language issues and low digital literacy. Also working jointly with local hospitals, pharmacies, and retail healthcare providers in tier-two and tier-three cities to gather operational data, understand user acceptance, and slowly scale up to out to locations other than Metros. This phased geographic expansion, was viewed as more achievable than going national right away. Even with these forward-looking suggestions, participants recognized that, currently, almost all DTx strategies are leaving rural audiences behind since a lack of localised content,

underdeveloped awareness with rural health professionals, and little-to-no digital health education initiatives have been constant associations given their rural health practice focus.

In conclusion, while urban India will remain the core audience and focus for DTx related innovation and adoption, the overall sustainability of this sector is upon the extent to which it can produce local and responsive solutions that tackle a specified infrastructure, education and linguistic need for rural and vulnerable communities. If companies can do this, it will improve brands' awareness, reach and impact, and ultimately contribute to the wider development aims of health equity and universal access to healthcare solutions in India's developing digital health context.

4.8 Theme 7: Regulatory Ambiguity

One of the major issues raised in the interviews, especially by participants from pharma and chemical companies was a lack of a clear regulatory base regarding DTx in India. Participants were uncertain about how their classifying DTx products would go and how the Central Drugs Standard Control Organisation (CDSCO) would be assessing their classification. For example, a marketing executive said, "I don't know how CDSCO will classify our DTx offerings", while a product manager from chemical company said, "I don't know if our app is a medical device or just software." Given this, it becomes evident how the established hesitance in industry engagement with DTx is due to legal uncertainty. Pharmacists spoke to a practical side to this confusion, specifically in relation to what they could ethically or legally share with patients as a concern. This regulatory confusion creates real-world impacts. Companies are currently forced to use vague and non-committal language like “supports health” or “a wellness aid” in their communications so that they do not accidently make medical claims which have not been validated. This conservative language takes away from the potential effectiveness of marking, and trust and perception for the patient. At this point in time, India doesn't have any guidelines or a robust regulatory framework for DTx. The CDSCO has put out draft guidance on Software as a Medical Device (SaMD), but these guidelines are limited to draft form and have not been finalized. The CDSCO did give an opportunity for public comment at a meeting on January 9, 2022, however, there is no

current roadmap for either finalizing or implementing, and so companies continue to operate in this space, potentially limiting innovation and time to adopt.

In summary, the lack of a clear and robust regulatory framework remains a significant barrier in realising the general use and enablement of DTx in India. Without regulatory clarity, firms remain hesitant in how and when they can market DTx, pharmacists lack confidence in encouraging patients to discussing DTx, and consumer trust in DTx continues to decline.

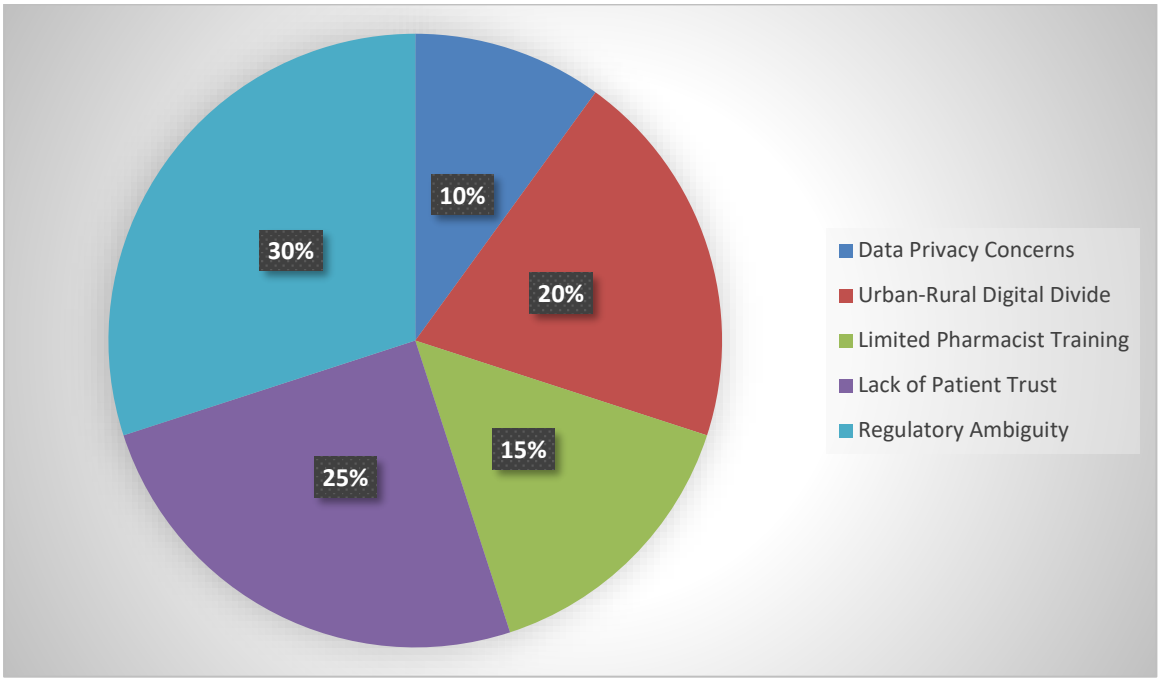

Figure 1- Key barriers to DTx adoption in India

4.9 Synthesis and Interconnected Insights

The interview data synthesise shows that while DTx has just begun to emerge in the Indian ecosystem, there is shared recognition by the range of participants as to its potential strategic role. Interviews with participants from pharmaceutical companies, digital health start-ups and pharmacy retailers' representatives recognised DTx as an avenue to support patient engagement, chronic disease management and brand differentiation in a growing competitive context.

Overall, the proposed action plan and suggestion for moving forward with DTx were quite positive. However, the pathway for wide scale adoption of DTx in India is not simple or

straightforward, and participants have shared several important enablers that align with their recommendations for scaling DTx in an effective and sustainable way.
Regulatory clarity: Representatives cited regulatory uncertainty as a limiting factor for DTx products, particularly in terms of classification, approval, and the allowed marketing claims.
Training for the healthcare professionals: Pharmacists and frontline health professionals are intended to be the key patient education piece for DTx. However, responses indicated that frontline workers do not have sufficient training, and don't receive structured support from the pharma companies.

Product bundling with traditional therapies: Participants expressed support for "bundling" DTx with traditional therapies. For example, if a diabetes management app was bundled together with an insulin prescription, it would be an easy option for patients and would allow branding for adherence. Participants did mention that the utility of this effort can vary by both specific technology and health condition. For example, chronic conditions like diabetes, asthma, or hypertension, where ongoing monitoring, behavioural change and self-management of a condition are critical, were mentioned as an excellent candidate for bundling. Acutely or short-term conditions provided a shared less opportunity for the ability to benefit from a paired DTx solution. The more sophisticated features of the technology (e.g., habit tracking, continuous feedback) are not as necessary for successful treatment. This aligns with the earlier findings in Section 4.4, where representatives emphasised that bundling worked best when the DTx meaningfully complemented the primary therapy, making treatment feel easier, safer, and more integrated into patients' daily routines.
Trust-building through physician recommendation. Trust in DTx was consistently associated with recommendation by the physician. Respondents indicated that patients are more likely to accept DTx apps if the treating doctor recommends the application as part of their treatment plan and takes the time to explain it to them.

When patients believe DTx will be easy to use, and beneficial to their health, there are likely to be increased adherence levels and DTx adoption. Addressing the issues posed by DTx in India demands implementation of a whole of ecosystem response, which combines policy reform, stakeholder education, user-centred design and trust.

Although the interviews were rich data, it is important to recognize some limitations. All participants were from urban areas, which limits application in rural areas. Some

pharmacists had very limited exposure to DTx apps. Additionally, DTx is a rapidly evolving landscape, therefore, these findings might change relatively quickly as new players and regulations emerge.

Key findings from qualitative interviews on DTx and pharmaceutical marketing in India have been presented in this chapter. In general, the data indicates an evolving sector that is open to innovation but limited by structural and cultural barriers. The next chapter will take these findings and make some recommendations on how both DTx development and pharma marketing may combine their work to differentiate healthcare-based services in India's distinct healthcare environment.

Theme	**Participant Quote**
Marketing Adaptation & Strategy Shift	DTx forces us to reconsider KPIs, app engagement is as critical as prescription volumes. (P2)
Trust as Foundation for DTx Adoption	If the doctor says the app, patients listen. If we tell them, they think it's optional. (P6)
Bundling DTx with Traditional Products	Here's your inhaler, and here's an app to make it work better. (P4)
Personalisation & User Engagement	Patients like apps that feel like they're made for them. (P5)
Pharmacists as DTx Enablers	Pharmacists are key advocates for explaining DTx to patients at the counter. (P1)
Urban–Rural Divide in DTx Adoption	Urban markets are easier to penetrate with DTx due to better digital literacy. (P1)

Table 2: Key Themes and Representative Participant Quotes

Chapter 5: Discussion

5.1 Introduction

This chapter examines these six themes in the findings which are marketing adjustments, trust issues, consideration of DTx being bundled with existing traditional products, personalization/user involvement, pharmacist as an enabler, urban-rural divide, and confusion in the regulatory landscape, in relation to the theoretical and observed literature reviewed in Chapter 2. We explore the way these interconnected themes portray the changing landscape of pharmaceutical marketing in India, primarily because of digital therapeutics. Discussions demonstrate how these themes validate, contradict or enhance existing understandings of development in marketing healthcare services, regulations, and technology adoption. In discussing the implications for pharmaceutical companies, healthcare providers, pre-market and post-market regulators, we also emphasis the limitations of the qualitative design.

5.2 Strategic Evolution of DTx Marketing in India

A crucial takeaway from this research has been the clear transition away from the traditional, physician-led marketing of pharmaceutical products towards patient-centric approaches adopted by manufacturing companies in response to the growth of DTx. Participants highlighted how DTx solutions have altered their KPIs, moving beyond prescription volume to tracking deeper patient engagement metrics such as app usage, adherence rates, and behavioural change indicators. This reflects Madanian's (2023) observation that Indian pharmaceutical companies are beginning to favour value-based care models, approaches that prioritise measurable patient health outcomes and long-term engagement over short-term sales volume. In the context of DTx, value-based care involves using technology to monitor ongoing patient progress, encourage adherence through AI-enabled behavioural nudges, and personalise interventions, thereby aligning commercial success with demonstrable health improvements.

The results reported in this article are consistent with previous research from Busse and Kunde (2021) and Dang (2020) , as they describe how the marketing narrative for digital

health products worldwide is shifting from a product-driven strategy to building sustainable behaviour change. More concerningly, while chemical companies are not the traditional pharmaceutical companies, still developing a pathway for its chemical products to intertwine with DTx solutions. Their willingness to spend money on DTx demonstrates how these tools are perceived to create commercial and clinical value, reiterating what the literature has suggested about cross-sector partnerships being the catalyst for DTx adoption in emerging markets.

Category	Enablers	Barriers
Regulatory Framework	Draft guidelines for SaMD by CDSCO indicate future direction	No clear DTx-specific policy or classification clarity
Stakeholder Engagement	Pharmacists and physicians can act as DTx advocates when trained	Pharmacists lack DTx-specific training and approved messaging guidelines
Product Strategy	Bundling DTx with medications simplifies adoption	Legal ambiguity restricts explicit marketing claims
User Experience	Personalised, vernacular apps improve patient engagement	Digital literacy gaps, especially in rural areas
Data Privacy & Trust	Data protection practices (e.g., pop-ups explaining privacy) foster trust	Public scepticism regarding data usage and unclear company transparency practices
Market Focus	Urban markets offer higher smartphone penetration and awareness	Rural India remains underserved due to infrastructure and awareness limitations

Table 3: Synthesis of Barriers and Enablers for DTx Adoption

5.3 Trust as a Cornerstone for Adoption

One notable finding across all interviews was the significance of trust in the promotion of DTx adoption. Trust in the end users emerged as a dominant theme across all participants, represent as physician referral, data privacy, or confidence impact. This finding is also consistent with Birkhäuer et al. (2017) who found in a meta-analysis that greater levels of trust in a health professional consistently demonstrates a link to better health outcomes, adherence and patient satisfaction overall. In India as a less-individualistic country, trust in a physician can be very personal or culturally based. Many interviewees, particularly pharmacists emphasised that their own recommendations only carried weight when supported by a physician's endorsement, underscoring the primacy of interpersonal trust over direct digital marketing.

In addition to clinical credibility, data privacy featured prominently. Interviewees expressed a desire for clarity regarding privacy protections, as legislated under India's new Digital Personal Data Protection Bill (2023), and for "infrastructure trust," as described by LoCurto and Berg (2016), which reflects confidence in the systems and institutions that govern the management of health data. Interpersonal trust (physician–patient) aspect of trust, and infrastructural trust (data governance) aspect of trust, are all expressed in this review of trust that aligns with the WHO framework developed in 2021. Trust in India's health systems may need to consider interpersonal trust and infrastructural trust in the future for successful DTx adoption. Companies integrating the above-mentioned components of trust into their marketing can leverage lower perceived risks, and encourage usage, and engagement by the patient.

5.4 Bundling and Frictionless Integration

Bundling DTx solutions with traditional medications was a consistently used method mentioned as a viable way to increased uptake, adherence, and patient perception. The sentiment was that patients were more likely to use digital tools when characterized as part of a treatment package and not as technology alone, Madanian's (2023) found that bundled health solutions improved user experience, and as well, improve patient compliance and foster brand loyalty. Others have reached similar conclusions in more general healthcare integration work where digital interventions are integrated with traditional therapies as a way to increase patient engagement and continued treatment Gupta, R. & Narayan, A.,

(2022). However, the literature suggests that bundling success may be highly dependent upon the illness and treatment requirements. Chronic conditions like diabetes, asthma or hypertension, where long-term behaviour change, monitoring, and self-management are the core components, may be more suitable for DTx–medication bundles (WHO, 2021). Acute or short-term conditions may be comparatively less beneficial however, as the prevalent sustained interaction features of DTx (e.g., habit feedback, longitudinal tracking) are not as relevant in such contexts.

This study's participants were clear that if a bundled offer references the DTx app, then there must be a distinction of the therapeutic DTx app component and the bundled therapy. But regulatory ambiguity tends to trigger cautious marketing language that can reduce the perceived value of the bundle. This finds congruence with international research (BfArM, 2023) that illustrates that bundled solutions were more likely to gain attraction and trust in patients when regulatory parameters are well established. As elaborated in the synthesis (Section 4.9), while there may be unique circumstances of successful bundling, there are unique challenge conditions at play that cross clinically significant patient type, appropriateness of technology, and clear communication of the value of the bundle to patients and providers. When the kind of condition, technology, and communication of value are not present, even if bundled, benefit of bundling that is, seamless no-friction experience of digital care and traditional care remains unrealised.

5.5 Regulatory ambiguity and Its Impact

The absence of regulatory guidelines from organisations such as CDSCO was consistently raised as a barrier by corporate participants. The uncertainty around whether DTx apps are software or medical devices means that marketers and legal teams are struggling. The literature also backs up this gap in regulation. While the CDSCO has a draft guidance for Software as a Medical Device (SaMD) APACMed (2021), it does not detail any DTx-specific frameworks, especially in the Indian context. As a result, companies are improvising by relying on generic claims such as 'supports health' as opposed to more impactful claims in which they're backed by evidence. This cautious tone makes marketing less effective and may influence user confidence. Consistent with concerns, the findings in this study suggest that opportunities for more creative, confident marketing may be unlocked if regulations

regarding DTx become more specific. In addition, doing so may be a pathway to full-fledged solutions integrated into mainstream healthcare systems, enabling greater access and adoption.

5.6 Pharmacists as Enablers and Gatekeepers

The function of pharmacists was an unexpected finding. Several participants pointed out that pharmacists are becoming increasingly frontline communicators of DTx, an area of professional growth. In a typical Indian pharmacy, patients often expect additional instruction from the pharmacist, especially when the prescription involves unknown items like mobile apps. Additionally, this expands the literature about DTx products, which has focused on physicians and their digital platforms as delivery agents of DTx (Kapoor & Patel, 2022). Pharmacists' roles provide important face-to-face activities at the junction of digital and traditional care. Their intrinsic credibility and proximity, provide a unique ability to impact health behaviours, especially for a first-time engagement with a health technology.

However, the pharmacists interviewed articulated their confusion over their role and what claims they can make ethically or legally about the DTx products. This speaks to the need for a marketing toolkit with explicit messages developed to educate and engage pharmacists on DTx benefits to their clients.

5.7 Importance of Personalisation

The conversation regarding personalisation suggested that it exceeds a basic marketing strategy, it is important for ongoing engagement. Each professional interviewed, especially those involved in product development or dedicated to the patient experience, stressed the importance of content, reminders, and tailoring features to meet individual user needs. Applications that respond to a user’s health patterns, languages, and behaviours, are more likely to be perceived as useful while becoming part of a user’s daily life. The usage of vernacular content as well as a simplified UI were seen to be vital to increasing the reach of the application, especially by older users or users who are not tech-savvy. Abou Hashish (2025) discuss digital empathy, the practice of designing digital health products while

considering the user's context as well as their emotional states. Findings from this study lend further weight to the notion that digital therapeutics must inform as well as resonate emotionally with the users if they are to be effective.

5.8 Urban Bias and the Rural Gap

One of the top challenges noted in the study is urban-rural imbalance in access and uptake of DTx. Most participants remarked that DTx efforts are currently directed more at urban users because urban users have better digital infrastructure, greater adoption of smartphones, and more health literacy. Participants indicated that to support rural rise DTx efforts may need to be simplified versions of apps, SMS appointment reminders, and linkages with local pharmacies or ASHA workers. Rural digital health projects are not new to India, but DTx would be very difficult to form within these projects. The literature is advocating for products to be designed and integrated in response to cultural, infrastructural and other sensitivities (Kanwar & Sharma, 2023), so this study implied we should not just design for a smartphone user in Delhi, but also a basic phone user in rural Bihar.

5.9 Practical Implications

This study provides many practical insights, useful for a range of professionals working in digital therapeutics (DTx) in India. A primary concern, expressed in all interviews, was the lack of regulatory guidance. Without clear guidance from an agency like the CDSCO, professionals are unsure how to classify, engage audiences in marketing or talk about DTx offerings. Policymakers must act quickly to fill this gap for innovation to flourish and market entry to be simplified. The role of pharmacists occurs many times as an important piece to connect DTx to patients. Many pharmacists are providing a service to patients and helping patients understand DTx however, they do not have training or resources. Structured education and resources on DTx would increase the ability for pharmacists to engage and encourage usage of DTx when speaking to potential patients for any other reason. Users recognized the value of simplicity, the option for local language, and personalisation as strategies to engage users. Important for developers to keep in mind intuitive design and

incorporate different user needs to consider everyone, especially those in non-tech, low-tech, and vulnerable populations in rural environments.

Grouping DTx with more conventional medicines was an effective method of increasing acceptance. Patients are more willing to try the app, with the perception that it is part of their treatment versus choosing to engage with it separately. But messaging and being supported and encouraged by health providers is critical. And physician endorsement is essential. The power of the recommendation from one's physician is very important. It was noted that a physician's recommendation can literally break or make acceptance of the DTx tools. By involving physicians relatively early in product development and training will increase acceptance and credibility for the patient. Overall, these considerations mean that acceptance of DTx in India indicates a combination of clarity on regulations, design which indicates user context, provision of relevant and intentional messaging, and buy-in from multiple stakeholders.

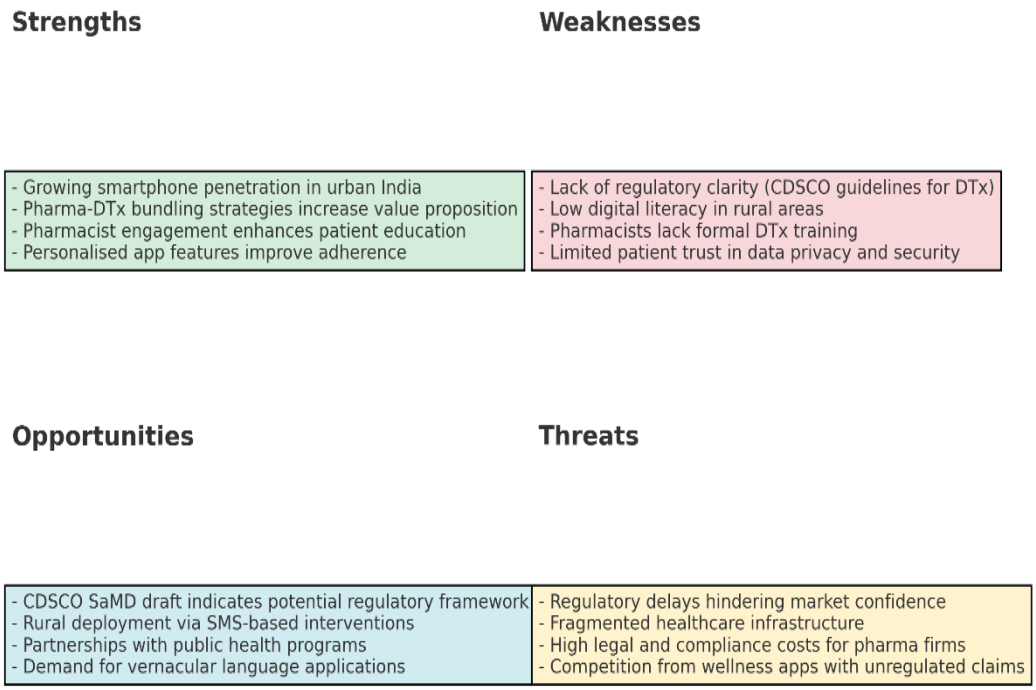

Figure 2- SWOT Analysis of Digital Therapeutics (DTx) Adoption in India

5.10 Limitations of the Study

Although this research offers important insights for DTx in India, we must recognize its limitations.

First, the sample size was small, with only seven interviews conducted. Although we attempted to represent different professionals (pharmaceutical companies, digital health startups, pharmacists) in the sample, the relatively small sample size may not be representative of the full range of professionals represented in India's multi-faceted healthcare system. Second, there were gaps in the representation of participant's, particularly healthcare professionals practicing in rural areas and government policymakers. Because of an urban bias in DTx adoption along with an urban bias in the sample where our findings may not provide evidence of the full extent of challenges and opportunities in less digitally mature or resource-limited settings.

Moreover, the methodology has its own limitations. All the interviews were conducted remotely using online applications or telephone calls. In some instances, logistical challenges mean that on occasion, interviews had to be re-recorded from original transcripts that likely reduced spontaneous or rich responses. Also, as data collection was done remotely, the researcher was more limited in observing non-verbal cues that can capture contextual aspects during qualitative interviews.

Ultimately, this study used only qualitative data. Using an approach based on qualitative interviews, enabled rich, in-depth understanding rather than offering statistical applicability as quantitative methods may provide. Given that there was no quantitative or numerical data, the results should be viewed as exploratory rather than definitive.

Future studies in this field might benefit from a mixed-methods design, using qualitative interviewing and qualitative surveying for a more holistic experience. Extending the geographic diversity of participants, especially to include perspectives from rural health contexts and public sector settings would improve the applicability and policy relevance of future research.

This study adds another work to a growing set in the field of digital health innovation in

emerging markets and provides practical evidence on how DTx is accepted, implemented, and marketed contexts of the Indian pharmaceutical, and retail pharmacy environment. Despite challenges to implementation and limited reach in rural contexts, a minimal level of trust, innovation, and willingness is present, as well as the basic level of infrastructure. With continued support and alignment, it is highly likely, that DTx could become an essential element of India's digital health strategy in the next few years.

Chapter 6: Conclusion

This research aimed to understand how and if digital therapeutics (DTx) are impacting sales and marketing approaches within the pharmaceutical landscape in India. With the increased of technology-enhanced healthcare delivery models, including the growing frequency of chronic disease, a new market is emerging in India for scalable (therapeutic interventions at a fraction of the development cost of traditional drugs), personalized (the ability to concurrently track patient-related outcomes), and low-cost therapeutic solutions. Digital therapeutics are potentially one of the most attractive responses to this market need as they offer interventions that are software-driven and have some form of legitimacy based on clinical evidence. However, the transition from traditional pharma marketing to DTx-rich marketing strategies is still quite far from a point of commercialization and layered with complexities. This final chapter critically synthesizes the findings from the previous chapters, considers the overall contributions of the research, discusses the implications of the study, and offers suggestions for future research.

6.1 Summary of Key Findings

This qualitative research addressed the question: What are, if any, changes in digital therapeutics (DTx) bringing to the marketing and sales paradigm in India's pharmaceutical industry? The qualitative data from seven semi structured interviews with DTx developers, pharmaceutical marketers and pharmacists have shown that there were multiple themes that show transformational shifts. For example, marketing is moving from physician centred to patient-oriented approaches to improve personalization and user engagement to increase adoption. Trust was recognized as a foundational element for DTx often created by doctor endorsement or transparency of data practices. DTx developers felt that bundling DTx with traditional medications increased credibility and perceived value. Pharmacists are perceived by the participants as key enablers in uptake of DTx; however, regulatory ambiguity may be a significant barrier to marketing claims and patient confidence. On top of this, an urban-rural gap showcased an imbalance between urban and rural engagement of DTx, with urban areas exhibiting more readiness to accept the use of DTx through better digital infrastructure. Pharmaceutical marketers who traditionally relied on sales uptake

(prescription counts) and doctor engagements are now beginning to include, or in some cases replace the actual performance metrics, such as app downloads, daily active users, adherence rates, and patient-reported outcomes indicators. Companies have started to include digital engagement measures as KPIs. Other companies, like chemical companies, may not be pharmaceutical companies, but realize they can provide DTx with a therapeutic ecosystem in their products. These findings illustrate the increasing importance of value-based marketing, where customer focus and measurable outcomes shape promotional activity (Choudhury & Kumar, 2023).

Trust has emerged as the one of the most important factors in patient adoption. It is widely acknowledged by professionals that patients are much more likely to engage with DTx tools that have been recommended by their physicians. Pharmacists shared a similar view. When there is no validation by a physician, patients tend to treat DTx as optional. This trust relationship is compounded by variability in patients' concerns about data privacy, the complexity of apps, and the fact that patients had not previously related to simple digital interfaces (e.g., click here to start, click there to stop). Representatives acknowledged that being upfront about how data would be used and providing uncomplicated onboarding paths helped improve trust.

Pharmacists surprisingly became a prominent high-impact bridge in the DTx value chain. While historical they simply filled medications for patients, they are now educating patients regarding apps, QR codes, and bundled digital goods. Participants from all pharmacies expressed that patients would often ask questions about DTx while paying, sometimes due to a lack of information from their physicians. Nonetheless, most of the pharmacists expressed uncertainty around the legal or clinical information they could provide. This uncertainty increases because they don’t yet have a set of guidelines from the regulators. In this regard, there is both a bottleneck and an opportunity. If equipped with appropriate supports and training pharmacies can be high-impact communicators in the DTx ecosystem.

Participants from highlighted that without sufficient guidance, it is unclear how they can legally or ethically present these as a bundle. Urban-rural discrepancies represent a major obstacle as well. Urban centres have relatively strong digital infrastructure and receptiveness, nonetheless, rural areas have barriers to access from smart phone and language to digital literacy. Participants suggested that vernacular interfaces, offline access,

and community pharmacist involvement could provide a touchier response to gaps in rural access.

Lastly, the lack of robust regulation remains the most frequently cited barrier. Not only does this limit marketing flexibility, but it also damages the innovation and creates legal dilemmas. Companies are not keen to represent their DTx tools as “treatment” or “intervention” without the formal designation from the Central Drugs Standard Control Organization (CDSCO). The draft guidelines on Software as a Medical Device (SaMD) exist (APACMed, 2021) but implementation and awareness are not widespread.

6.2 Theoretical Contributions

This study adds to the increasing scholarly research in the field of DTx and the emerging market context focused on India. Previous studies, to date, have identified various key aspects of the technology adoption process in the Indian context of mHealth and telemedicine (Choudhury et al., 2023; Sharma & Gupta, 2022), including elements of trustworthiness, perceived utility, and ease-of-use. This study carries those insights forward by providing nuance and evidence to aspects of DTx patient adoption within the domain of pharmaceutical marketing. The study also situates findings into connections (Vargo & Lusch, 2008) implying pharmaceutical companies may now be thinking about themselves not just as sellers of products, but as co-creators of value through integrated health solutions. This research also examined intermediary-based adoption processes as the use of digital health was mediated by non-prescribing participants acting in new intermediary roles outside of utilized, challenging the traditional dominant physician adoption perspective of health innovations and offering a new network perspective that reflects the Indian context.

6.3 Practical Implications

The results of this study clearly point to a few key areas in which actionable interventions could encourage the adoption and usage of the digital therapeutics (DTx) domain in India’s pharmaceutical ecosystem. The pharmaceutical industry is in the process of transition to patient-centred and tech-centric strategies, and the following actionable recommendations will serve as a framework for strategic and operational assessment and planning by industry professionals, public policymakers and healthcare providers.

First, regulatory clarity - where a clear regulatory framework and guidance are required, i.e. there is currently confusion over the classification of DTx products and their consequent compliance obligations, which is holding back innovation and market uptake in India. Without guidance from authorities such as the Central Drugs Standard Control Organization (CDSCO), companies do not know how to present the efficacy and intent of use with DTx solutions. Clearer frameworks regarding expectations on labelling, privacy, claims and approval pathways will be critical to establishing and standardising practices and enhancing confidence across the sectors. Secondly, pharmacists have demonstrated potential and promise of being effective communicators and facilitators in the DTx adoption process. They interact with patients on a continuous basis, especially in cities Tier 1 or Tier 2, which means they know the area and would be able to introduce DTx tools at the point of care. Unfortunately, the lack of formal training and support means pharmacists cannot convey accurate and compelling information surrounding DTx. Therefore, pharmaceutical firms and health-tech providers should also consider providing targeted educational tools, like toolkits or certification modules, to educate pharmacists about DTx to provide them with the knowledge and confidence they need to champion its adoption. Thirdly, the design of DTx applications must be appropriate to the socio-cultural and linguistic realities of the Indian population. Participants in this study suggestively pointed out that user engagement significantly increased when applications contained content in the regional language, some level of intuitive visual design, and considered users with limited levels of digital literacy. This is particularly relevant due to India's digitally underserved rural areas where accessibility can be increased through the consideration of simplified interfaces and mobile-first development. Fourth, consistently pairing DTx tools with traditional pharma products has been suggested as a viable way to improve perceived value and uptake. When patients receive an app as part of their treatment journey or the provision of treatment for chronic diseases (such as asthma, diabetes, etc), they become more accepting of it as a legitimate therapy. However, the communication must complement the grafted value and ensure the additional digital component, and this is not just a marketing trick. Finally, trust certainly represents an important building block for DTx success. Building and maintaining trust among patients, necessitates collaborative work across the healthcare ecosystem. Critically, clinicians are the gatekeepers of validating digital therapies for patients. In addition, transparent data use, active communication about privacy, and using real world evidence to

evidence the use of digital therapy, all contribute to building patient trust. And these processes must be respectful of the Digital Personal Data Protection Act (2023) that establishes data governance criteria for health technologies in India.

In conclusion, these implications can provide a strategic pathway to foster greater adoption and sustained utilization of digital therapeutics in India. Collectively, all these priorities create an ecosystem where innovation, regulation, and trust can combine to improve public health.

6.4 Future Research Directions

This study recognizes that digital therapeutics (DTx), as a segment of the rapidly emerging Indian healthcare ecosystem, is advancing at such speed that the slight findings reveal will only provide a snapshot of the wider, rapidly evolving landscape. There is certainly room for academic research to continue to develop the work presented here, covering both the voids and complexities discussed in this study.

Future research could value a mixed methods approach. While this present study was designed qualitatively to cover professionals' experiences holistically, quantitative data such as usage of digital therapeutics in several environments, health outcomes, and adoption metrics would help give the research another verification of whether the specific DTx was effective. Triangulation between these categories of data would lead to a more thorough, and generalisable, understanding of the impact of DTx on patient care delivery and pharmaceutical marketing.

Additionally, there is also a necessity for patient-oriented research. This present study provides the surface of understanding professional perspectives (pharmacists, product managers, marketers), while there is an opportunity for studies that have patients involved to investigate what motivated them to use the DTx tools, what concerns they had, if any, and their experiences as users. In the future, insights from end users would inform product design and usability, while also providing a better practical understanding of real-world challenges to adoption.

Longitudinal studies would also be an interesting area for future research. As the regulatory framework evolves in India and people's digital literacy skills grow, longitudinal studies

could indicate adoption patterns and how and if they change over time. Longitudinal studies could also see how patients could maintain engagement, long-term clinical outcomes, and measure the effectiveness of bundled marketing strategies. Similarly, longitudinal studies could provide an understanding of the effects of early adopters on adoption of the broader mHealth market.

There is a need for policy in comparative research, especially to place India's regulatory development in an international context. Germany has a formal process for overviewing health applications through its DiGA (Digitale Gesundheitsanwendungen) programme, and the United States has the FDA's Digital Health Centre of Excellence to help with development of DTx which can provide a pathway to evaluating and reimbursement for the treatment. These types of oriented frameworks could be helpful to understand how global countries look at DTx and could inform India's approach to policy development around DTx and potentially speed up the process of building a detailed and measurable set of policies for the area.

Finally, research on the deployment of DTx tools for focused rural and semi-urban populations has been largely unexamined and is important work to do. The urban-rural digital divide continues to be an issue in India, assessing the feasibility of interventions designed for lower-literacy, or low-connectivity, environments using pilot studies or community-based participatory research design may be a good option. Interventions could include app-light models, SMS-based monitoring tools, or pharmacy led awareness campaigns.

In conclusion, whilst this study has made an important initial contribution to an understanding of DTx in the Indian pharmaceutical landscape, it simultaneously underscores the scope of untapped areas. Future research should aim for inclusive, experimental and contextually relevant research to take the field forward in India, with the unique healthcare, technological, and cultural context of the country taken into consideration.

6.5 Final Reflections

In summary, the findings of this study reveal that the use of digital therapeutics in India is still not on everyone's radar, but all parties involved in pharma and chronic care are aware

of their potential uses to innovate how pharmaceuticals are marketed, and chronic care is delivered. New KPIs and means of engaging patients, changing roles of pharmacists, and innovating on care pathways will facilitate a transition to stimulus and technology fuelled marketing of pharmaceuticals that is more collaborate and expectant of outcomes. Nevertheless, realising that potential requires appointing regulatory certainty, trust mechanisms, and user design in 'first place'. As India pivots to digitalise its health infrastructure, DTx is likely to become a complementary solution that forms a new foundation for pharmaceutical strategy. As with all new fields, this will require ensuring innovation is inclusive, and digital health does not only enhance the care of a few but truly becomes something pan Indian. Through collaboration, evidence generation, and regulation, DTx can truly redefine what it means to deliver care in the 21st century.

References

Aarushi & Zack, 2024. *Business models for digital therapeutics: Opportunities and barriers.* Journal of Medical Internet Research, 23(6), e25359. Available at: https://www.mdpi.com/2077-0383/13/2/403 [Accessed 1 July 2025].

Abou Hashish, E.A. (2025) 'Compassion through technology: Digital empathy concept analysis and implications in nursing', *Digital Health*, Vol. 11, Article 20552076251326221. Available at: https://doi.org/10.1177/20552076251326221 [Accessed 23 July 2025].

Adjekum, A., Blasimme, A. and Vayena, E. (2018) 'Elements of trust in digital health systems: a scoping review', *JMIR* Digital Health, 6(12), e11254. Available at: https://doi.org/10.2196/11254 [Accessed 23 July 2025].

APACMed (2021) *Digital health regulation in India: Position paper on SaMD implementation*. Available at: https://apacmed.org/wp-content/uploads/2021/10/Digital-Health-Regulation-in-India_Position-Paper.pdf [Accessed 24 July 2025].

Armeni, P., Krebs, L., Vejlgaard, T., & et al. (2024). *Exploring the potential of digital therapeutics. Digital Health, 10.* Available at: https://journals.sagepub.com/doi/10.1177/20552076241277441 [Accessed: 19 July 2025]

BfArM (2023). *Digital Health Applications (DiGA) – Overview. Federal Institute for Drugs and Medical Devices (BfArM).* Available at: https://www.bfarm.de/EN/Medical-devices/Tasks/DiGA-and-DiPA/Digital-Health-Applications/_node.html [Accessed: 15 July 2025].

BfArM (2023). *The Fast-Track Process for Digital Health Applications (DiGA): A Guide for Manufacturers, Service Providers and Users. Federal Institute for Drugs and Medical Devices (BfArM).* Available at: https://www.bfarm.de/SharedDocs/Downloads/EN/MedicalDevices/DiGA_Guide.pdf [Accessed: 15 July 2025].

Birkhäuer, J., Gaab, J., Kossowsky, J., Hasler, S., Krummenacher, P., Werner, C. and Gerger, H. (2017) 'Trust in the health care professional and health outcome: a meta-analysis', *PLOS ONE*, 12(2), e0170988. Available at: https://doi.org/10.1371/journal.pone.0170988 [Accessed: 9 August 2025].

Braun, V. and Clarke, V. (2006) 'Using thematic analysis in psychology', *Qualitative Research in Psychology*, 3(2), pp. 77–101. Available at: https://doi.org/10.1191/1478088706qp063oa [Accessed: 19 July 2025].

British Educational Research Association (BERA) (2018). *Ethical Guidelines for Educational Research* (4th ed.). British Educational Research Association. Available at: file:///C:/Users/Ajay%20Dhulugade/Downloads/BERA-Ethical-Guidelines-for-Educational-Research_4thEdn_2018.pdf [Accessed: 19 July 2025].

Canvas Business Model. *Sales and Marketing Strategy of PhableCare*. Available at: https://canvasbusinessmodel.com/blogs/marketing-strategy/phablecare-marketing-strategy [Accessed: 18 July 2025]

Catapan, S.C. et al. (2025) 'A systematic review of consumers' and healthcare professionals' trust in digital healthcare', *NPJ Digital Medicine*, 8:101. Available at: https://www.nature.com/articles/s41746-025-01510-8 [Accessed: 24 July 2025]

Centers for Medicare & Medicaid Services (CMS) (2023). *Establishing reimbursement mechanisms for digital therapeutics using CPT and HCPCS codes.* CMS. Available at: https://downloads.regulations.gov/CMS-2023-0121-21272/attachment_1.pdf [Accessed: 18 July 2025]

Choudhury, A., Sharma, R. & Kumar, S., 2023. *Consumer acceptance of digital therapeutics in India: A study of trust and cultural influences*. Journal of Digital Health, 5(2), pp.45–60. Available at: https://www.researchsquare.com/article/rs-4979499/v1 [Accessed: 21 June 2025].

Contract Pharma (2024) 'Big Pharma ramps up expansion to emerging markets', *Contract Pharma*, 27 February. Available at: https://www.contractpharma.com/big-pharma-ramps-up-expansion-to-emerging-markets/ [Accessed: 9 August 2025].

Dang, A., Arora, D. & Rane, P., 2020. *Role of digital therapeutics in transforming healthcare delivery*. Health Policy and Technology, 9(4), pp.526–534. Available at: https://journals.lww.com/jfmpc/fulltext/2020/09050/role_of_digital_therapeutics_and_the_changing.13.aspx [Accessed: 21 June 2025].

Digital Therapeutics Alliance, 2023. *Understanding digital therapeutics*. Available at: https://dtxalliance.org/understanding-dtx/ [Accessed: 23 June 2025].

Digital Therapeutics Alliance (2023) *Understanding digital therapeutics*. Available at: https://dtxalliance.org/understanding-dtx/ [Accessed: 23 June 2025].

Dr Reddy's & ICICI Lombard (2021). *Dr Reddy's and ICICI Lombard collaborate for pilot launch of first-of-its-kind integrated and cashless digital health solution.* Dr Reddy's Laboratories; ICICI Lombard. Available at: https://www.drreddys.com/media/1015037/dr-reddys-icici-lombard-digital-health-offering-joint-press-release-27jul.pdf [Accessed: 18 July 2025].

European Union (2016) *Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data and repealing Directive 95/46/EC (General Data Protection Regulation)*. Official Journal of the European Union, L119, pp. 1–88. Available at: https://eur-lex.europa.eu/eli/reg/2016/679/oj [Accessed: 9 August 2025].

FICCI (Federation of Indian Chambers of Commerce & Industry), 2022. *Indian pharmaceutical industry: Vision 2030*. Available at: https://link.springer.com/chapter/10.1007/978-3-030-13716-8_11 [Accessed: 23 June 2025].

Gupta, R. & Narayan, A., 2022. *Mental health app usage trends in India: A qualitative study*. Indian Journal of Psychiatry, 64(1), pp.34–41. Available at: https://journals.lww.com/aoam/fulltext/2024/23040/assessment_of_psychiatric_illness_among_pulmonary.10.aspx [Accessed: 23 June 2025].

Gupta, S. & Park, C., 2021. *Business models for digital therapeutics: Opportunities and barriers*. Journal of Medical Internet Research, 23(6), e25359. Available at: https://www.jmir.org/2024/1/e48996/ [Accessed: 24 June 2025].

Hwang, P. T. et al. (2023) 'Digital Therapeutics for Improving Effectiveness of Pharmaceutical Drugs and Biological Products: Preclinical and Clinical Studies Supporting Development of Drug + Digital Combination Therapies for Chronic Diseases', *Therapeutic Innovation & Regulatory Science*. Available at: https://pubmed.ncbi.nlm.nih.gov/38256537/ [Accessed: 27 July 2025].

Headspace Research Team (2024). *The Real-World Impact of App-Based Mindfulness on Perceived Stress: An Observational Study*. JMIR mHealth and uHealth.
Available at: https://mhealth.jmir.org/2024/1/e52968/ [Accessed: 19 July 2025].

IBEF (India Brand Equity Foundation), 2024. *Indian pharmaceuticals industry analysis presentation*. Available at: https://www.ibef.org/industry/indian-pharmaceuticals-industry-analysis-presentation [Accessed: 24 June 2025].

Kaia Health (2023) 'Kaia Health's digital therapy shows sustained impact on pain reduction, functional ability, mental health and cost-effectiveness in 12-month study', *Kaia Health Newsroom*, 24 October. Available at: https://kaiahealth.com/newsroom/kaia-healths-digital-therapy-shows-sustained-impact-on-pain-reduction-functional-ability-mental-health-and-cost-effectiveness-in-12-month-study/ [Accessed: 9 August 2025].

Kalaari Capital (2021). *Uniquely India: Demographics and Digital Adoption Across Rural–Urban India*. Available at: https://kalaari.com/wp-content/uploads/2021/08/uniquely-india.pdf [Accessed: 19 July 2025].

Kanwar, V., Chaudhary, S. & Sharma, A.K. (2023) 'Challenges in Implementing Digital Health Services in Rural India', *Journal of the International Society for Telemedicine and eHealth*, 11(e3). Available at: https://hdl.handle.net/10520/ejc-jisfteh_v11_n1_a3 [Accessed: 27 July 2025].

Kraus, M., Stolk, P. and Habl, C. (2024). *The three-year evolution of Germany's Digital Therapeutics reimbursement program*. Digital Medicine, 7(1), Article 57. Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC11126413/ [Accessed: 17 July 2025].

Kunde, K. & Busse, T.S., 2021. *Digital health interventions in pharma: A strategic perspective*. Health Marketing Quarterly, 38(4), pp.291–309. Available at: https://link.springer.com/article/10.1186/s13063-025-08809-7 [Accessed: 24 June 2025].

LoCurto, J. and Berg, G.M. (2016) 'Trust in healthcare settings: scale development, methods, and preliminary determinants', *SAGE Open Medicine*, 4, p. 2050312116664224. Available at: https://doi.org/10.1177/2050312116664224 [Accessed: 9 August 2025].

Lupin, 2022. *Lupin Digital Health partners with Aptar Digital Health to launch India's first connected smart respiratory device*. Available at: https://aptar.com/news-events/aptar-pharma-partners-with-lupin-to-launch-indias-first-connected-smart-device-for-respiratory-disease-adhero/ [Accessed: 24 June 2025].

Lupin Digital Health (2024). *Lupin Digital Health partners with Medicover Hospitals for comprehensive post-discharge cardiac care*. Lupin Limited. Available at: https://www.lupin.com/lupin-digital-health-partners-with-medicover-hospitals-for-comprehensive-post-discharge-cardiac-care/ [Accessed: 18 July 2025].

Madanian, S. et al. (2023) 'Patients' perspectives on digital health tools: facilitators and barriers to uptake', *Auckland University of Technology*, 71 articles reviewed. Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10294099/ [Accessed: 25 July 2025].

Mehrotra, S., Singh, V. & Joshi, A., 2023. *Bridging digital divides in Indian healthcare: Strategies for equitable access*. BMJ Global Health, 8(1), e010442. Available at: https://gh.bmj.com/content/8/1/e010442 [Accessed: 27 June 2025].

Ministry of Electronics and Information Technology (MeitY) (2023). *Digital Personal Data Protection Act, 2023, Government of India.* Available at:

https://www.meity.gov.in/static/uploads/2024/06/2bf1f0e9f04e6fb4f8fef35e82c42aa5.pdf [Accessed: 18 July 2025].

NITI Aayog, 2021. *Ayushman Bharat Digital Mission*. Available at: https://www.mohfw.gov.in/?q=en/pressrelease-87#:~:text=ABDM%20envisions%20a%20seamless%20digital,better%20diagnoses%20and%20treatment%20outcomes [Accessed: 27 June 2025].

Novartis Foundation (2022) 'Community-based hypertension management programmes: adapting strategies for emerging markets', *The Journal of Clinical Hypertension*, 24(12), pp. 1501–1508. Available at: https://pmc.ncbi.nlm.nih.gov/articles/PMC5717296/ [Accessed: 9 August 2025].

OECD, 2023. *Digital health technologies: Global adoption and policy lessons*. Available at: https://www.oecd.org [Accessed: 27 June 2025].

Palinkas, L.A., Horwitz, S.M., Green, C.A., Wisdom, J.P., Duan, N. & Hoagwood, K. (2015). Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. *Administration and Policy in Mental Health and Mental Health Services Research*, 42(5), pp. 533–544. Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4012002/ [Accessed: 19 July 2025].

Saunders, B., Sim, J., Kingstone, T., et al. (2017). *Saturation in qualitative research: exploring its conceptualisation and operationalisation. Qualitative Research, 17(5), pp. 557–570.* Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5993836/ [Accessed: 19 July 2025].

Sengupta, A. & Ghosh, A., 2022. *Rural healthcare and digital health in India: Policy reflections*. Journal of Social and Economic Development, 24(3), pp.350–362. Available at: https://onlinelibrary.wiley.com/doi/abs/10.1002/wmh3.70015 [Accessed: 1 July 2025].

Sharma, P. & Gupta, A., 2022. *Digital health marketing in India: Trends and strategies*. Indian Journal of Marketing, 52(1), pp.30–45. Available at: https://phfi.org/wp-content/uploads/2022/06/Journals-March-31-2022.pdf [Accessed: 6 July 2025].

Sharma, V. & Sharma, A., 2021. *Customer relationship management in healthcare: Future directions*. Indian Journal of Marketing, 51(2), pp.40–49. Available at: https://www.tandfonline.com/doi/abs/10.1080/10696679.2024.2394485 [Accessed: 6 July 2025].

Singh, R., Kapoor, S. & Patel, V., 2022. *India's vision of a healthy and developed nation from the perspective of the healthtech industry*. Journal of Medical Marketing, 22(1), pp.10–20. Available at: https://www.researchgate.net/publication/385085445 [Accessed: 6 July 2025].

Sinha, N. & Rahul, R., 2023. *Regulatory readiness for digital therapeutics in India*. Health Policy and Technology, 12(2), pp.100–110. Available at: https://journal.bengkuluinstitute.com/index.php/JKM/article/view/1200 [Accessed: 6 July 2025].

The Digital Personal Data Protection Bill, 2023. PRS Legislative Research (2023). *Digital Personal Data Protection Bill, 2023*. Available at: https://prsindia.org/billtrack/digital-personal-data-protection-bill-2023 [Accessed: 24 July 2025].

Vargo, S.L. and Lusch, R.F. (2008) 'On value and value co-creation: A service systems and service logic perspective', *European Management Journal*, 26(3), pp. 145–152. Available at: https://doi.org/10.1016/j.ecolecon.2007.10.003 [Accessed: 1 August 2025].

Wellthy Therapeutics, 2022. *Adding a digital zing to chronic diseases*. Available at: https://www.wellthytherapeutics.com/blog/adding-a-digital-zing-to-chronic-diseases/ [Accessed: 6 July 2025].

Wellthy Therapeutics (2022) *Adding a digital zing to chronic diseases*. Available at: https://www.wellthytherapeutics.com/blog/adding-a-digital-zing-to-chronic-diseases/ [Accessed: 8 August 2025].

World Health Organization (2021) *Global strategy on digital health 2020–2025*. Available at: https://www.who.int/docs/defaultsource/documents/gs4dhdaa2a9f352b0445bafbc79ca799dce4d.pdf [Accessed: 27 July 2025].

World Health Organization (WHO) (2021) *Global strategy on digital health 2020–2025*. Geneva: World Health Organization. Available at: https://iris.who.int/bitstream/handle/10665/344249/9789240020924-eng.pdf?sequence=1 [Accessed: 9 August 2025].

Wysa (2025) *Wysa: Your AI mental health ally*. Available at: https://www.wysa.io/ [Accessed: 6 August 2025].

Appendices

Thematic Appendices for Interviews on Digital Therapeutics in India

Introduction

The appendices to this thesis comprise of a thematic analysis of seven interviews with stakeholders from the health care and pharmaceutical sector in India, related to the uptake and adoption of DTx and practical implications. These stakeholder perspectives come from interviews with people from Cipla, Sun Pharma, Platinum Pharmacy, Ashirwad Pharmacy, Neogen Chemicals, Wellthy Therapeutics and Sangam Pharmacy. There are several themes derived from the interviews such as opportunities for DTx in India, trust-building strategies, regulatory issues and challenges, changes in marketing approaches, personalized options in DTx apps, rural versus urban perspectives, roles of pharmacists, and bundling DTx with medicines. Each appendix will provide extracts from the interviews structured using descriptive quotes for each theme to substantiate the analysis in the thesis.

Appendix A: Interview Schedule

Introduction and Background

Can you describe how your team at Cipla is using digital therapeutics these days?

What do you think about DTx in India? Is there good potential?

DTx Marketing Strategies

How does DTx change the usual marketing approach in pharma?

Do you market DTx differently to urban and rural users?

how is DTx changing the usual pharma marketing style?

User Engagement and Adoption

What kind of trust-building is needed for DTx to be successful?

How does personalization in apps help?

Regulatory and Compliance Challenges

Have you faced any issues around regulations or legal stuff with DTx?

What do you do to make patients trust the app?

Future Directions

Final advice for improving DTx adoption in India?

Appendix B: Opportunities for DTx in India

This appendix collates interviewee opinions on the potential for digital therapeutics (DTx) in India, especially for chronic disease management and the predominant use of smartphones.

Cipla Representative: "Yes, I think it has a lot of potential. But we need to build trust. But we need to build trust. People still trust pills more than apps."

Sun Pharma Representative: "Right now, I think diabetes and mental health are the two biggest areas. From a marketing point of view, DTx lets us talk to patients directly, through apps or digital platforms."

Platinum Pharmacy Pharmacist: "I think it's in helping people manage long-term illnesses better, like diabetes, high BP, those kinds of things. Many patients forget to take medicine or don't follow the diet properly."

Ashirwad Pharmacy Pharmacist: "I think it can really help people with long-term health issues. You know, many of our patients forget to take their medicines or they don't follow the diet properly."

Neogen Chemicals Product Manager: "Honestly, it has a lot of potential. So many people in India are using smartphones, even in smaller towns. And chronic diseases like asthma or diabetes are very common."

Wellthy Therapeutics Representative: "Oh, it's huge for chronic stuff like diabetes. There's so many young people with phones who want digital help along with their medicines."

Sangam Pharmacy Pharmacist: "It's about helping patients stick to their treatment. So many people forget their meds or don't know how to manage their diet. DTx apps can guide them, like reminding them to take their pills. The opportunity's huge because phones are everywhere now."

Appendix C: Trust-Building Strategies

This appendix highlights some ideas for trust in DTx, emphasizing the role of doctors, good app design, and data privacy transparency.

Cipla Representative: "Mostly through doctors. If the doctors tell a patient that this is an app to use, if they use the app, it works. Also, we use some small research results or user stories. Even small graphs help like showing that blood sugar improved."

Sun Pharma Representative: "Trust is the main thing. They want to know it will work. So, we may give clinical trial data and patient user success stories. But the best evidence will always be if the doctor recommends it."

Platinum Pharmacy Pharmacist: "Honestly, they need to hear about it from their doctor. If I say, 'Why don't you get this app,' they will ask, 'Did my doctor say I need this?" And, sometimes, they will ask about privacy. Like, 'Is my information safe?'"

Ashirwad Pharmacy Pharmacist: "It is simple, a good description and it has to come from someone they trust; for the most part, that being their doctor. Also, the app just has to work well, easy to use, and privacy is huge."

Neogen Chemicals Product Manager: "Patients need to feel safe using the app. First thing we do is make sure the app clearly says that their data is protected. When a doctor tells a patient that the app is useful, they believe it more."

Wellthy Therapeutics Representative: "We have real results such as our trial data on better sugar control. Getting a doctor champion to support it is very helpful since they will say great things about it and patients listen to them. Also, the app's got to meet those two criteria of feeling safe and being easy to use."

Sangam Pharmacy Pharmacist: "It all comes back to credibility. Patients trust us pharmacists, but they really trust their doctors. If the doctor says, use this app, they're more likely to try it. We also need to show how it works, like sharing data that the app helps control blood pressure."

Appendix D: Regulatory Challenges

This appendix outlines the regulatory uncertainties in DTx in India, particularly in relation to classification and marketing claims.

Cipla Representative: "Right now, it’s unclear how the government is treating DTx. Like, is it a medicine? or A device? There are no proper guidelines yet from CDSCO."

Sun Pharma Representative: "One of the biggest problems is all the confusion about how DTx should be classified. Is it a medical device? Just software? Do we need onboard practice approval from CDSCO? We just don’t have solid answers don’t have real guidance?"

Platinum Pharmacy Pharmacist: "With medicines we know what we can say and what we can't, but for apps, it's completely new area. We were told to follow what we could read from the pharma company’s handouts in the pharmacy, but they are not always clear on the testing/claims."

Ashirwad Pharmacy Pharmacist: "With a standard medicinal product we know what we can say what dosage we can say, side effects, and so forth. But with the app we don't know. For example, can we say that it manages diabetes?"

Neogen Chemicals Product Manager: "We do not know if the CDSCO sees the app as a medical device." Therefore, we must be very careful in our language. We avoid the use of words such as 'treat' and just say 'helps in management.'"

Wellthy Therapeutics Representative: "Man, regulations are impossible. rules are so vague. we don't want to risk it, so we err on the side of caution. we determine our advertisements based on what we say. so, we do avoid a lot of language to cover our own back."

Sangam Pharmacy Pharmacist: "we know how to advertise drugs. but apps? there isn't a clear rule. we must be careful not to make it sound like overselling, like we can't say that an app controls diabetes, because we just don't know what is and isn't allowed from CDSCO."

Appendix E: Changes in Marketing Approaches

This appendix explores how DTx is reshaping traditional pharmaceutical marketing, including direct-to-patient strategies and digital campaigns.

Cipla Representative: "Earlier, we just looked at how many prescriptions we were getting. Now, we also check how many people are using the app, how often they use it, how many complete their programs."

Sun Pharma Representative: "Before, marketing was mainly about doctor visits, brochures, conferences. Now, we also run digital ads, app tutorials, push notifications. We've started bundling our medicines with DTx apps."

Platinum Pharmacy Pharmacist: "Earlier it was simple, doctors wrote a medicine, we gave it. Now, they come with QR codes and leaflets about apps. It's more about patient education not just giving out medication.

Ashirwad Pharmacy Pharmacist: "They used to just give us medicine samples or posters of a certain drug. Now, they give us a brochure and QR codes for apps!

Neogen Chemicals Product Manager: "Traditional pharma is all about visiting doctors, giving samples. But DTx is more direct. We're also talking to patients now. So, we're trying things like Instagram ads, small YouTube videos."

Wellthy Therapeutics Representative: "Normal pharma is all about doctors and reps. With DTx, we're going straight to patients, social media, hospital tie-ups. We're also bundling our app with diabetes medicines."

Sangam Pharmacy Pharmacist: "It's different from just handing out pills. With drugs, we follow the prescription. With DTx, we're explaining apps, which is new. Pharma reps give us flyers or QR codes instead of samples now."

Appendix F: Personalization in DTx Apps

This appendix reviews the value of personalized features in DTx apps to improve user engagement and adherence.

Cipla Representative: “When the app sends a message like, ‘Hey Ajay, don’t forget your lunch,’ how does that feel? It feels more personal. People don’t want to stop using it.”

Sun Pharma Representative: “If the app doesn’t feel personal, the user will stop using it. If I don’t generally exercise on the weekend, I won’t want to use the app to remind me.”

Platinum Pharmacy Pharmacist: “They like it if the app sends reminders aligning with when the patient takes their medication. They will ignore a random reminder.”

Ashirwad Pharmacy Pharmacist: “They love that the app feels like it is made for them. For example, one lady told me her app reminds her to take her pills after lunch, and she is doing that.”

Neogen Chemicals Product Manager: "People want something that feels created for them. Like our app, we can shake up alerts when the air quality in the user’s area is poor, or they need to use their inhaler."

Wellthy Therapeutics Representative: "Our app does similar. It sends reminders based on their habits, the way they eat. The data shows those personal nudges help people stay with it longer."

Sangam Pharmacy Pharmacist: "Patients like apps that feel bespoke for them. One app we’ve seen sends a notification on their mealtime habits, like a reminder to check sugar after breakfast."

Appendix G: Urban vs. Rural Differences

This appendix examines the differing responses to DTx between urban and rural populations in India.

Cipla Representative: "In cities, people have smartphones and know how to use apps. In villages, many don’t even know what DTx means. So, we’re trying to make content in local languages and keep the app simple."

Sun Pharma Representative: "Right now, our marketing campaigns are primarily on urban areas ii. This is where people already use smartphones and technology. Rural areas are also being looked at, but that will take time."

Platinum Pharmacy Pharmacist: "We are in the city so, urban people have smartphones and use apps but the rural people, especially the nearest villages coming to us don't have smartphones or not confident to use".

Ashirwad Pharmacy Pharmacist: "People in the cities know more about smartphones and apps. But the people in villages don't even have smartphones. They are unclear with all this."

Neogen Chemicals Product Manager: "Right now, we’re mostly focusing on urban users, places like Mumbai, Delhi, Bangalore. For rural areas, it’s more difficult. Many still don’t use smartphones."

Wellthy Therapeutics Representative: "Urban’s easier. They’ve got phones, internet, so we hit them with digital ads and hospital links. Rural area is a tough to target since less tech, less know-how."

Sangam Pharmacy Pharmacist: "Urban patients are way more curious. They’ve got smartphones and ask, what’s this app does? Rural patients, though, barely know about DTx. Some don’t have smartphones or don’t know how to use them."

Appendix H: Role of Pharmacists

This appendix demonstrates the importance of pharmacists in increasing DTx awareness and engagement.

Cipla Representative: "They're super helpful. Sometimes patients ask them things like, 'Is this app safe?' or 'Do I have to pay?' We are even training pharmacists to help explain DTx to customers now."

Sun Pharma Representative: "Pharmacists have the trust of patients, so having them explain how the app works is helpful. We have started giving the pharmacists some training on how to talk about DTx."

Platinum Pharmacy Pharmacist: "We're almost like a bridge between the app and the patient. "We provide them with QR code cards from pharma companies, and sometimes assist them to scan and download the app."

Ashirwad Pharmacy pharmacist: "We speak to patients as they are picking up their medication. We have some QR code cards readily available on the counter. If they need help scanning and downloading the app, I am happy to assist."

Neogen Chemicals Product Manager: "Patients trust their local chemists. We are planning to give pharmacists QR codes and some basic app info so they can explain it to patients."

Wellthy Therapeutics Representative: "They're at the counter, right? So, we give them QR codes to share our app when people buy medicines. If a pharmacist says, 'This app is good for your diabetes,' people listen."

Sangam Pharmacy Pharmacist: "We're the ones patients see regularly, so we can introduce apps when they pick up meds. I'll say, this app can track your blood pressure and show them the QR code."

Appendix I: Bundling DTx with Medicines

This appendix discusses the benefits and challenges of bundling DTx apps with traditional medicines.

Cipla Representative: "Like with diabetes, we give the medicine along with access to the app, it becomes a full care package. Patients like it because everything comes together."

Sun Pharma Representative: "We've started bundling our medicines with DTx apps. For example, if someone gets a diabetes medicine, they also get an app to help manage their glucose."

Platinum Pharmacy Pharmacist: "When an app is given together with the medicine, it feels like a proper part of the treatment. Patients don't think of it as something extra."

Ashirwad Pharmacy Pharmacist: "When the app is part of the treatment, like given free with the medicine, patients feel it's official. One man was happy to see the app mentioned on the medicine box."

Neogen Chemicals Product Manager: "When we give an app together with the product, people see it as a full package. We're even planning to offer a free 3-month subscription with our asthma product."

Wellthy Therapeutics Representative: "We team up with pharma to bundle our app with their diabetes meds. Patients love it, it's like a free add-on."

Sangam Pharmacy Pharmacist: "When the app comes with the meds, patients take it more seriously. Like, one patient got a free app trial with his BP meds and was more open to trying it."