RESEARCH PAPER

Limitations of Digital Marketing in Pharmaceutical Companies of India

Pradeep Kumar Jha*[1], Shailendra Kumar Jha[2]

[1] Research Scholar, School of Commerce and Management Studies, Sandip University, Sijoul, Madhubani, Bihar, India

[2]Associate Professor, School of Commerce and Management Studies, Sandip University, Sijoul, Madhubani, Bihar, India

Corresponding Author*

Pradeep Kumar Jha

Research Scholar,

School of Commerce and Management Studies,

Sandip University, Sijoul, Madhubani, Bihar, India

Email: pradeepjha8051@gmail.com,

Abstract

Digital marketing is gaining popularity among the Indian pharmaceutical industry because it is better positioned to improve their visibility, communication, and customer interaction, but its potential is limited due to regulatory, technological, and organizational barriers. This paper will look at the major obstacles to the implementation of digital marketing practices by Indian pharmaceutical firms and specifically look at the regulations like the Uniform Code of Pharmaceutical Marketing Practices and the Digital Personal Data Protection Act. The quantitative research design was used, and the sample size was 200 employees who were randomly selected and worked in ten of the biggest pharmaceutical companies that were involved in digital marketing. Structured questionnaires were used to gather the data, which revolved around regulatory, technological, and organizational constraints, and analyzed to determine the common patterns and possible solutions. The results show that UCPMP 2024 places severe restrictions on promotional statement, creativity and transparency, limiting flexibility of marketing campaigns. Also, companies are being pushed towards price-based strategies by the growing commoditization of generic drugs and the threat posed by e-pharmacies. There are also technological obstacles, including poor infrastructure, low internet penetration, and digital illiteracy of healthcare practitioners especially in rural settings, which further hinder adoption. The DPDP Act 2023 would also place considerable compliance costs, and other reasons such as low digital maturity, a lack of ROI monitoring systems, and reliance on the traditional methods of marketing would delay digital transformation. To overcome these obstacles, organizations should embrace the use of modern technologies, improve regulatory/digital literacy, and craft culturally sensitive content approaches that can promote ethical, effective, and sustainable digital marketing in a fast-changing pharmaceutical market.

Keywords: Digital Marketing, Pharmaceutical Industry, Regulatory Restrictions, Social Media, Telemedicine, Data Privacy

How to cite this article: Jha PK, Jha SK. Limitations of Digital Marketing in Pharmaceutical Companies of India. Int J Drug Deliv Technol. 2026;16(24s): 908-923; DOI: 10.25258/ijddt.16.24s.107

1. INTRODUCTION

In today's digital world, companies all over the globe are using digital communication and marketing instruments more and more to improve their online presence and strengthen their relationships with their target audience. The pharmaceutical industry is also getting on board with this change, with businesses using new digital marketing techniques to sell their goods and services. Digital marketing is very important for pharmaceutical companies in India because it helps them have a stronger online presence, target the right audience, market their products in a cost-effective way, track their performance, and follow the rules. Digital channels of communication are also useful because they help businesses interact with customers, improve targeting, encourage collaboration, give real-time insights, and stay in line with industry standards. When used wisely, these tools can greatly improve communication methods and lead to better results. Within the pharma industry, Health Care Providers (HCPs) represent the primary target audience, and their engagement is often

facilitated through Medical Representatives (MRs). This research paper aims to examine the digital marketing and communication tools employed by pharmaceutical companies [1].

There are several benefits to the digital world, including better sales, easier communication with customers, and cost-effectiveness and financial viability [2]. Many businesses changed and adapted to provide services digitally to minimize physical contact following the COVID-19 pandemic in 2020, protecting both consumers and employees. According to Chiplunkar *et al.,[3]* this disruption is consistent with the trend of physicians and patients using the internet to meet their information demands through webinars, video conferencing, telemedicine, e-detailing, e-CMEs, medical websites, web platforms, and the like.

Digital marketing has established a strong presence across both organized and unorganized sectors. These platforms not only create new opportunities for industries to increase revenue but also provide consumers with accessible information, enabling them to make informed choices or consider alternatives [4]. While the pharmaceutical sector has already adopted digital platforms globally, its reach in India remains limited. Although innovative technologies are rapidly emerging, India is still in the early stages of fully integrating these advancements into the pharmaceutical domain [4].

India is recognized globally as one of the leading suppliers of generic medicines. With the rise of digital marketing, the pharmaceutical and healthcare industries are undergoing rapid transformation faster than sectors like retail, media, banking, airlines, and telecom [5]. As the world moves online and mobile phone usage increases, customers now expect instant access to services, products, and information [6]. According to Standards (2019), this shift highlights the growing importance of digital tools, although the pharmaceutical industry has not yet fully adapted to these new technologies [7].

In India's growing pharmaceutical sector, digital marketing still faces many challenges. One major challenge is strict government regulation. The Uniform Code of Pharmaceutical Marketing Practices (UCPMP) 2024, introduced by the Department of Pharmaceuticals in March and made partly mandatory for FY 2024–25, places clear restrictions on how companies can promote their products [8]. For example, firms are not allowed to use claims such as "new" or "safe" without strong scientific evidence, and they cannot give gifts or incentives to doctors. Despite the fact that these rules are aimed at ensuring ethical standards, they diminish flexibility in communication as well. This makes most marketing campaigns seem repetitive, uncreative, and failing to assist brands in standing out in a competitive market.

The other big obstacle is that the generic products in India have been fully commoditized, and thus, there are numerous companies offering the same active molecules. That essentially eliminates any kind of brand positioning, and companies have to either fight primarily on price or simple promotions to retain clients [9]. Besides the organizational obstacles, such as poor coordination between regulatory, sales, medical, and marketing departments, the outdated or unconnected CRM, and digital platforms contribute to inconsistency in campaigns and restrict personalized interaction. Moreover, the absence of digital maturity, the delay of the MLR approvals, low digital skills, and the lack of a data-management plan contribute to the problem, so pharmaceutical companies struggle to launch campaigns on time and provide appropriate returns on investments. Lastly, a parsimonious attitude toward branding and limited funds to spend on patient-centric efforts provide little opportunity to innovate, invest in an extended digital strategy, or take risks creatively, particularly in small and medium enterprises as shown in table 1.

Table1: various challenges in digital marketing on pharmaceutical companies in India

Challenge Area	**Description**
Regulatory Compliance	There are strict regulations on marketing and commercial strategies for UCPMP 2024.
Creative Stagnation	Overly safe and uniform campaigns fail to resonate or differentiate.
Commoditized Products	A market with a lot of generics restricts brand storytelling.
Internal Silos & Tech Gaps	Outdated systems and disconnected organizational workflows make execution difficult.
Digital Immaturity	Low ROI is caused by inadequate data, delayed approvals, and weak digital abilities.
Conservative Budgets & Culture	Low investment in patient engagement

	stifles creativity and flexibility.

1.1 Scope and Significance

The pharmaceutical industry in India is quickly moving to becoming digital. In 2023–24, the economy in the country was worth about $50 billion. By 2030, it should be worth $130 billion [10]. This fast development renders internet marketing even more important as businesses move away from conventional marketing strategies and toward more tech-driven ones. This article talks about the main reasons individuals don't use digital technology. These consist of: regulatory obstacles like the new UCPMP 2024 law that makes it harder to promote products and talk to healthcare professionals; managerial obstacles, like the fact that healthcare representatives are slow to approve content and don't have good digital skills; and data protection issues, which are related to the Digital Personal Data Protection Act 2023, which says that companies must store data locally and get clear permission before using it. The importance of studying these limits comes from the fact that they have an obvious impact on business results and public health. For pharmaceutical businesses, strict rules, slow approval procedures, and weak digital systems make digital marketing less profitable and make it harder to talk to health care providers, especially in smaller towns and villages, where in-person visits are becoming less common [11]. Also, new data privacy laws make it more expensive to follow the rules and create legal risks. If there aren't strong systems in place, these problems can make patients less trusting and limit personalized communication from a broader public health standpoint, comprehending and addressing these challenges is crucial not only for business expansion but also for guaranteeing the ethical and reliable dissemination of health information, thereby safeguarding the welfare of individuals in India's burgeoning pharmaceutical market.

1.2 Methodology

The current quantitative research employed a random sampling design to select 200 employees from ten leading Indian pharmaceutical firms known to be utilizing online marketing methods [12]. These are all pharmaceutical companies that make medicines: Sun Pharmaceutical Industries, Cipla, Abbott India, Aurobindo Pharma, Alkem Laboratories, Divid Laboratories, Zydus Cadila Healthcare, and Lupin Limited. We got the data by asking a group of the chosen staff members what they thought about the problems that the pharmaceutical sector faces when it comes to using internet-based advertising. This study will utilize a cohort of 200 employees, with the sample being drawn from ten Indian pharmaceutical companies that regularly utilize digital marketing approaches. The objectives and finances of every organization will determine how they use digital marketing in the Indian pharmaceutical industry and what results they get [1]. It is feasible to develop a complete structure encompassing the principal elements typically found in research designs and methodologies for analyzing digital marketing strategies within this sector. Develop research objectives: OK, then, to begin with, we must clear up what our research objectives are. Typically, this entails making the brand more known, pushing certain products, reaching out to new groups, drawing leads, or simply making customers more loyal and happier fans. Carry out some market research: Well, the best thing to do before we implement any digital marketing game plan is to conduct market research to ascertain who the target market is, what they are vibing, what they are doing online, and how they surf the net. To eschew that data, we are likely to rely on focus groups, surveys, interviews, and data crunching. Determine digital channels: When we have the study data ready, the next thing to do is to determine the digital channels that are most appropriate in reaching that crowd that we have just created. That is why it is email campaigns, content development, mobile apps marketing, and those digital marketing platforms; those are all the digital marketing strategies we are considering. We have to assemble a content plan that is responsible for what the people we want to reach are also interested in. It could be the development of blogs, research, short videos, infographics, or interactive media to package concrete information on diseases, treatment, and medications. And to increase the number of people who can actually visit the site and the materials that are written, we will have to work harder on our SEO strategies, including research on our keywords, on-page optimization, meta tags, and link-building.

2. Overview of Digital Marketing in the Pharmaceutical Industry

2.1 Evolution of Digital Marketing

The story of the way the digital marketing in the pharmaceutical industry developed is that of rapidly adjusting to the new technologies, regulations, and buyers [13]. The popularization of digital marketing in the pharmaceutical industry began at the beginning of the 1990s. Simple websites and email messages

shown in Fig. 1 assisted businesses to send their messages to more individuals and disseminate informational materials more rapidly. Two of the earliest companies to adopt such digital tools were Pfizer and Roche in the case of well-marketed drugs such as Viagra and Herceptin. They resorted to internet advertising and patient education materials to help them generate patients and interested doctors. In the 1980s and early 2000s, the change happened faster when drug companies stopped using print and TV ads and started running digital ads that went straight to consumers. The regulatory agencies became more significant, particularly when it came to controlling what individuals reported on TV and radio, as shown in Figure 1. This caused businesses to move to more controlled digital areas. Facebook, Twitter, and Instagram are just a few examples of social media sites that have become increasingly significant. This allows pharmaceutical companies talk to particular categories of patients, provide them with personalised content, and have medical conversations. Since the 2010s, omnichannel advertising, which includes websites, search, social media, email, video, and mobile applications, has grown more popular. Data analytics and customer relationship management (CRM) systems are becoming more and more important because they let businesses tailor content, keep track of how well their campaigns are working, and quickly fulfil the demands of patients as well as healthcare providers. employing medical professionals and patient advocates as marketing influencers builds trust and educates individuals in additional real, personalised methods. Individuals are using AI, chatbots, virtual reality (VR), and augmented reality (AR) to communicate and get knowledge in new ways. Resources enable simple-to-do remote detailing, targeted advertising, and accurate, interactive experiences. These are all very important in the day and age of telemedicine. The healthcare sector is changing its focus to putting patients first as digital transformation continues. Today, marketing strategies are all about getting truthful and forthcoming, following the rules, and understanding and meeting the requirements of consumers [14]. Digital marketing is important for the pharmaceutical industry today because it lets companies interact with customers in real time, target their campaigns accurately, and get measurable results in a field that needs to be flexible and follow the rules [15].

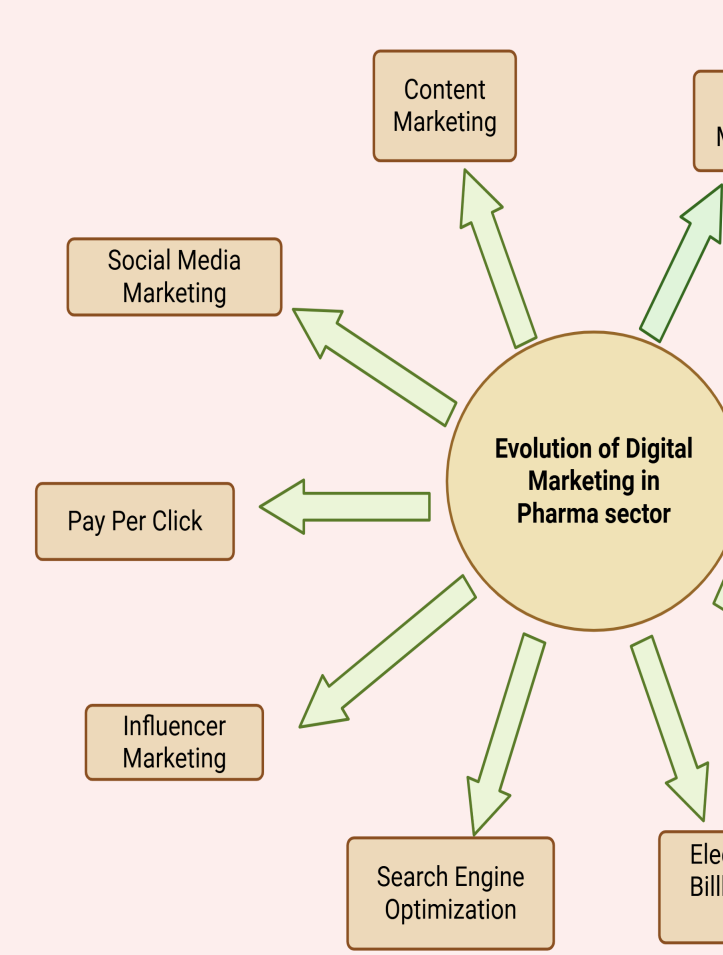

Figure 1: Evolution of Digital Marketing in Pharma Sector

2.2 Digital Marketing Tools and Platforms:

Digital marketing tools and platforms are now necessary in the pharmaceutical industry to better and more legally connect with healthcare professionals, patients, and other stakeholders (Figure 2) [16]. By 2025, drug companies will be using a powerful set of digital marketing tools to reach more people, tailor their messages, and track the success of their campaigns [17]. Table 2 shows digital marketing tools and platforms in the Indian pharmaceutical industry.

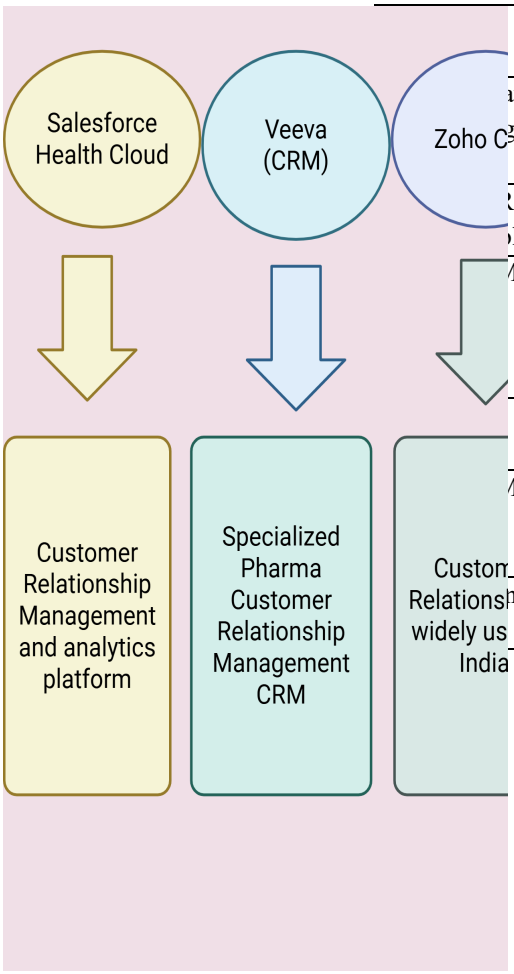

Figure 2: Digital Marketing Tools and Platforms

Table 2: Digital Marketing Tools and Platforms in the Indian Pharmaceutical Industry

Tool/Platform Name	Description	Use Case in Pharma Marketing	Key Features
Salesforce Health Cloud	Customer Relationship Management (CRM) and analytics platform	Predictive modeling, tailor-made content	Patient360 view, predictive analytics, compliant data handling
Veeva (CRM)	Specialized pharma CRM	HCP engagement, regulatory compliance, and sample tracking	CLM tools, regulatory compliance, and sample management
Zoho CRM	CRM is widely used in India	Customer marketing orchestration	Workflow automation, omnichannel campaign optimization. Salesforce
HubSpot	Marketing automation and lead management	Campaign creation, lead nurturing	Email marketing, lead scoring, automation tools
Adobe Experience Manager	Content management & personalization	Personalized experiences, campaigns	Content workflow, personalization, multichannel integration with analytics
Brandwatch, Meltwater, Talkwalker	Social listening and sentiment analysis tools	Monitoring HCP and patient sentiment, competitive insights	Social listening, sentiment analysis, dashboards
WhatsApp Business	Mobile messaging platform	Direct HCP/patient	Automated chat, broadcast lists, secure

		communication, appointment reminders
atic	AI-driven ad placement	Targeted pharma advertising with audience precision
Rep (E-latforms	Remote detailing & HCP engagement	Virtual HCP engagement, compliant detailing
Marketing	Regulatory-compliant email outreach	Nurturing HCPs and patients, promotional/educational emails
My	Regional SEO and local search visibility	Local clinic visibility, HCP discovery
Marketing	Blog, video production, and educational content tools	Disease awareness, patient education, HCP knowledge support
nsultancy	Specialized pharma digital marketing agencies	Strategy, compliance, omnichannel marketing

3. Adoption Trends in the Indian Pharmasector

The Indian pharmaceutical industry is going through a major digital transformation. This is happening because of changes in technology, rules, and the needs of healthcare workers and patients [18]. By 2025, digital maturity has become a key trait of both multinational and top domestic pharmaceutical companies. These companies are quickly moving toward omnichannel marketing ecosystems that bring together traditional and digital touchpoints [19]. This includes using field reps, e-detailing platforms, email, WhatsApp, social media, and personalized content management systems all at the same time to get HCPs more involved and teach patients more. A big change is happening from using a lot of different digital tools to using full, tech-led platforms. As regulations get stricter in India (like UCPMP 2024), marketers have to deal with two problems: making sure they follow the rules and expanding personalized communication [8]. AI and machine learning are very important here because they make predictive modeling, hyper-personalized messaging, and real-time analytics possible for campaign optimization. Salesforce Health Cloud, Veeva, Zoho CRM, and HubSpot are all common tools that help with automation and targeting based on data. These platforms also help you divide your audience by practice area, behavior, and history of engagement, which makes sure that your outreach is relevant and effective [20].

SEO and content marketing are still very important, especially as voice search and regional language queries become more common. Pharmaceutical companies now make multilingual digital content, like

blog posts, videos, and educational materials, to reach people in Tier-2 and Tier-3 cities [21]. Doctor-led videos and partnerships with influencers have also become more popular. They offer real ways to connect with people and build trust, as long as all content follows drug promotion rules [22].

4. Current Trends in Indian Pharma Digital Marketing

4.1 Social Media and Influencer Engagement

In 2025, Indian pharmaceutical companies' digital marketing strategies have changed the way brands talk to healthcare professionals (HCPs), patients, and people in general [17]. Social media and influencer engagement are now key parts of these strategies. Organizations are using sites like LinkedIn, Instagram, YouTube, and new ones, including Threads and Bluesky, to share educational content, run disease awareness campaigns, and have conversations with customers in real time. Video-driven content, like patient testimonials, doctor-led explainers, and treatment walkthroughs, works especially well because it builds trust while following India's unique rules for healthcare promotion. Brandwatch, Meltwater, and Talkwalker are examples of social listening tools that are very important for keeping an eye on how people feel and what they're talking about on social media [23]. This feedback in real time lets you make quick changes to your campaign, respond quickly to new problems, and manage your reputation proactively. AI-powered CRMs also help plan the best way to share content so that HCPs and patient communities are most likely to engage with it [24]. Research and expert opinion show that being real is still a must in pharma social media marketing. Generative AI makes it easier to make content and reach the right people, but the human element sharing personal stories, feelings, and experiences is what builds trust and keeps people coming back. In India's competitive pharma market, companies need to find a balance between coming up with new ideas and following the rules of ethical marketing, compliance, and choosing the right influencers to work with [25].

4.2 Mobile Apps and E-detailing

In 2025, mobile applications and e-detailing became very important parts of the digital evolution of Indian pharmaceutical advertising**.** E-detailing, additionally referred to as electronic or digital detailing, uses interactive technological devices like tablets, laptops, or remote screens to send healthcare professionals (HCPs) product information, educational materials, and personalised demonstrations [26]. This method increases participation by providing information-driven conclusions, simplicity, and standardisation that traditional paper-based detailing can't. Some of the most important features are slides and videos that have been approved as compliant content, interactive elements that encourage participation, and strong tracking of HCP interactions for ongoing improvement. Increasingly, pharmaceutical companies are relying on e-detailing platforms, which allow individuals to communicate face-to-face and via telephony [27]. Such networks enable reps to update on the current data in calls, customize the material based on the HCP preferences, and schedule visits faster. Statistics such as the time spent on each slide, interaction rates, and feedback about the surveys will assist the representatives and managers in determining the effectiveness of their speaking skills in influencing prescription behaviors [28]. With this information at hand, one is in a position to take specific follow-up action and manage the field force in a more strategic way. More frequently, pharma companies are operating on the e-detailing platforms that allow individuals to communicate with one another both physically and through the telephone [27]. Such platforms allow reps to be able to see real-time information when they make a phone call and modify the content according to the wishes of HCPs and schedule appointments faster [29]. With this information, it is possible to take specific actions afterwards and coordinate the field force in a more strategic manner. E-detailing and mobile applications can make the operations easier, yet they could also be used to make the brand experience homogenous by ensuring the messages share similarities and comply with the strict regulations of pharmaceutical advertisement in India [30]. They also save money and cut back on the wastage produced through printing and distributing of physical advertisements. Overall, these innovations assist drug companies in collaborating with healthcare professionals to ensure that their field and digital sales activities are coordinated [31].

4. 3 Role of Telemedicine and E-pharmacies

The ways individuals in India get health services are altering. Telemedicine and e-pharmacies make it easier to access treatment. A series of rules that have been put in place in the last few years has made such a big change possible. Telemedicine can be considered legal due to the National Medical Commission Act (2019), which allows telemedicine to be declared lawful, and the upcoming Telemedicine Practice Guidelines (TPG), scheduled for publication in 2020

[32]. It makes it easy to offer medical consultation with registered medical practitioners (RMPs) regardless of the geographical location, thus providing an opportunity to deliver advice through audio, video, or written means [33]. The regulations prescribe the methodology of patient identification, obtaining informed consent, the allowed modalities of interaction, and the allowed pharmacologic interventions in order to keep the patients safe and within the legal framework. Telemedicine is a bridge between urban and rural medical care. It lets people in areas with few medical choices or who live far away from them directly access a network of qualified healthcare professionals [34]. The system is also making it easier for different kinds of conversations to happen, like those between doctors and patients, doctors and caregivers, and even doctors themselves [35]. It becomes easier for medical professionals to work together to provide care by making it easier for them to connect with people from various regions of the world.. Telemedicine and e-pharmacies work in unison to make the remote acquisition of medical care feasible as it allows people to use online platforms to place a prescription and acquire medications [36]. Regulatory oversight means following the Drugs and Cosmetics Act of 1940, which says that only licensed pharmacies can sell drugs and ensure they meet quality standards [37]. E-pharmacies have grown because more people in India own smartphones and know how to use them. They make it easier for patients by delivering medications to their homes and helping them stick to their medication schedules [36]. These platforms often work with telemedicine providers to fill prescriptions, which helps keep patient care going. E-pharmacies also help lower out-of-pocket costs by being open about drug availability and offering competitive prices [38].

5. Limitations of Digital Marketing in the Indian Pharma Sector

5. 1 Regulatory and Legal Restrictions

Table 3 talks about the main rules and laws that pharmaceutical firms in India must comply with when they do digital marketing in 2025. It also talks about the importance of ethics, openness, data privacy, and complying with the rules.

Table 3: Key Regulatory and Legal Restrictions in Pharmaceutical Digital Marketing in India

Regulatory/Legal Restriction	Description	Ref.
Uniform Code for Pharmaceutical Marketing Practices (UCPMP) 2024	Sets ethical standards for pharma marketing, bans misleading claims, freebies to doctors, and requires transparency in all promotions	[8]
Evidence-Based Claims Requirement	All digital marketing clai evidence, such as clinical t	
Ban on Misleading Advertisements	Marketing materials must claims	
Transparency and Ethics in Engagement	Interactions with healthca transparent and ethical	
Data Privacy and Patient Consent Laws	Digital campaigns must including India's Data Pr protection and consent	
Restrictions on Freebies and Gifts	Gifts, freebies, or incenti strictly limited	
Mandatory Compliance Audits and Material Review	Pharmaceutical companie materials and practices for	
Training Requirements for Sales Teams	Sales and marketing team ethical and regulatory stand	
Reporting and Disclosure of Marketing Expenses	Companies must disclose regulatory bodies	

5.2 Limited Digital Literacy Among Stakeholders

The fact that people within the Indian pharmaceutical industry don't know how to utilize online resources is a big problem for effectively making use of digital marketing and medical technology [1]. Medical professionals, patients, and even medical employees do not have the technological abilities and intellectual knowledge they need to use the online environment effectively [47]. Digital levels of literacy also show a big difference between urban and rural areas; only about 61% of people in cities in India are competent, while only 25% of people in rural regions are [48]. This difference makes it harder for people to use electronic health records initiatives, telehealth services, and other digital advertising campaigns, especially in rural and underserved areas [49]. Also, the lack of digital literacy makes it harder for people to understand informed consent and privacy, since they don't always know how their data is gathered and utilized. The phenomenon mentioned above creates distrust against digital health initiatives, thus limiting digital intervention strategies [50]. Furthermore, health practitioners are observed to be resistant to digital tools, mainly due to the fear of possible failures of the systems or augmentation of the patient-interaction load, which only exacerbates the digital transformation efforts in the industry [51]. It is, therefore, important to close the digital divide by conducting specific training and increased awareness programs to all stakeholders in the Indian pharmaceutical sector to be able to exploit the full potential of digital marketing and health technologies [52].

5.3 Data Privacy and Ethical Concerns

Data privacy and ethical issues are the critical issues facing the Indian pharmaceutical industry, especially with the adoption of the Digital Personal Data Protection (DPDP) Act, 2023, and its associated laws becoming effective in 2025 [53]. These laws impose strict requirements regarding the acquisition, processing, and use of personal and sensitive information about health by pharmaceutical organizations. Since the amount of patient data is significant in the clinical trial process, research projects, and the healthcare delivery system, compliance with these regulatory requirements is mandatory to protect the rights of individuals and maintain community trust [54]. The DPDP Act provides that the personal data can only be collected with well-defined and legitimate purposes; any other use will require the explicit and informed consent of the data principal [55]. This kind of rule has an element that says pharmaceutical companies can't use patient information in any way other than what is clearly stated. Some rules must be followed when it comes to data stewardship of minors and other vulnerable groups [56]. These rules demand proof of guardian approval and more security. Also, the law assumes that the information's usage is clear; organizations must tell people what types of data are being collected, why the data is being utilized, and what methods are utilized for storing or sharing the data. This kind of honesty is important for keeping ethical standards and keeping the trust of the patients. Pharmaceutical companies ought to develop good rules about how to handle data and hire Data Protection Officers to make sure they follow them to ensure data is handled correctly [57]. As a greater number of individuals use cloud-based apps and the industry moves toward digital technology, strict cybersecurity rules are needed to stop data breaches from happening [58]. Not following the DPDP Act could lead to big fines and damage to your reputation.

Moreover, the digital marketing of pharmaceutical companies is also covered under the ethical issues. The industry is not supposed to participate in false information, exaggerations, or any other activities that might expose the patients to loss of confidentiality and trust. In the context of digital marketing, the accuracy of the promotional materials and compliance with the principles of transparency are the most important moral principles that must be followed [59].

5.4 Technological Barriers and Infrastructure Gaps

The technological barriers and infrastructure issues are major limitations in the effective implementation and scaling of innovations in the healthcare and pharmaceutical industry [60]. Recently published studies and scope evaluations have demonstrated that inadequate technological infrastructure, characterized by insufficient internet connectivity, limited access to digital platforms, and suboptimal integration of health IT systems, constitutes a significant barrier to the broad acceptance of digital health technologies and value-based treatment models. In particular, areas with underfunded health systems will be having a hard time using novel innovations like artificial intelligence, telemedicine, and new drug delivery systems because they don't have the basic technology or trained workers [61]. In the pharmaceutical sector, digital transformation efforts are slowed down by old legacy systems, a lack of expenditures in modernization, and the fact that the new digital architecture can't be added to the complicated manufacturing processes [62]. These roadblocks lead to interruptions, quality problems, and problems with scalability, all of which hurt the pathways to advancement and the time it takes to get novel medicines and drug delivery systems to market. The supply network is also weak because it relies too much on outside sources for active pharmaceutical ingredients (APIs) and other important raw materials [63]. This shows that there are holes in the framework that put manufacturing and the safety of people at risk. Non-biological barriers, including the scalability of manufacturing, regulatory complexity, and the restricted adoption of emerging technologies like organ-on-a-chip and nanoparticles [64], further hinder the translation of scientific discoveries into clinical applications for drug delivery. To solve these problems, it requires cross-sector investments in upskilling the workforce, public-private partnerships, and specific government policies that encourage the development of basic infrastructure and the creation of a strong innovation ecosystem that can meet the most current health needs [65].

5.5 Inadequate ROI Tracking and Measurement

Poor Return on Investment (ROI) tracking and measurement is also a major impediment to the strategic implementation of healthcare and pharmaceutical technologies, especially with the spread of digital health and big data solutions [66]. Although significant investments are made, organizations are prone to an inability to properly measure performance improvement owing to fragmented data platforms, the absence of

interoperable analytics infrastructures, and deficiency of standardization of outcome measurement systems. PubMed and systematic literature reviews in Elsevier and Springer point to the deficiency of structured and longitudinal monitoring mechanisms in the context of evidence-based decision-making, in the context of objective evaluation of financial and clinical returns, and in the context of continuous improvement of quality [67]. The conventional methods of evaluation including randomized controlled trials and pre-set clinical benchmarks often do not keep up with the iterative nature of digital innovation and, thus, provide delayed or incomplete feedback loops of ROI, particularly in the case of small and medium-sized enterprises that have limited resources, high costs, and long regulatory processes. In addition, not all institutions are based on heterogeneous electronic medical record (EMR) practices, leading to the use of scattered and unstructured data that cannot be aggregated and compared easily, which makes the process of accurately measuring the value created by new technologies even harder [68]. The latest articles by Springer and Taylor and Frances suggest the combination of sophisticated forms of data warehousing solutions, federated databases, and agile evaluation model to enable a more intensive and quicker ROI examination, but its implementation has not been uniform among health systems across the world [69]. In this environment, the gap on ROI tracking should be filled with cross-disciplinary efforts, whereby the source of data should be aligned, the result measurement should be automated and the evaluation measurement should be more flexible and technological. That will maintain the stakeholders on the same track and develop a more open and systematic environment of quantifying the financial and patient-centered returns [70].

5.6 Resistance from Traditional Marketing Channels

Another significant obstacle to the transition of the healthcare and pharmaceutical industry to the digital marketing processes has been cited as the traditional resistance in the marketing channels [71]. Recent articles indexed on Scopus underscore the fact that the old marketing techniques, as represented by print advertising, television, radio and community outreach still prevail in some population segments, especially among the older people and in rural areas, thus leading to an aversion to embrace the digital platform which is not well known to them. This resistance can be deeply rooted in years of experience with established trust in the traditional channels, a sense of reliability of physical contact, and fear of the dynamics of digital transformation, which breaks the existing relationships between professionals and patients [72]. In addition, the utilization of digital tools by traditional marketers is also frequently problematic concerning the interpretation and exploitation of various tools that makes the adoption process difficult and results in internal organizational conflict between existing practice and new technologies. Despite the rising amounts of digital expenditure in healthcare advertising, most of the advertisement monies have shifted to digital media with more than three-quarters of the entire advertisement monies billed to the digital media, this remains an implicit reliance on the traditional media due to its perceived capacity of building credibility and familiarity [73]. The answer to this resistance should be in the integrated marketing approaches which will help in bridging the gap between the traditional and new digital marketing approaches [74], education education-specific intervention which will help promote the digital literacy to marketers and a data-proven argument as to the importance of digital marketing which will help reduce the level of skepticism and the smoother levels of transitioning [75].

5.7 Language and Cultural Diversity

Cultural competency is becoming increasingly crucial to health professionals worldwide because language and cultural diversity have far-reaching implications on healthcare delivery and care outcomes [76]. As recent reviews highlighted on Scopus index show, interventions to enhance cultural competence are meant to enhance the quality of healthcare among the minority groups, decrease disparities, and lead to the creation of more equal care practices but the successful implementation of these practices is still uneven in all countries and sectors [77]. Cultural competence requires being aware of the various beliefs of patients and being able to reflect on the cultural context of one's own beliefs and attitudes and being able to transition to a more biopsychosocial model of treating patients through patient empowerment, shared decision-making, and negotiating culturally consistent treatment plans [78]. Studies also indicate that practitioners of culturally and linguistically diverse (CALD) backgrounds still encounter such challenges as discrimination, exclusion based on the existing professional and institutional structures, and hierarchical barriers to their integration into practice communities [79]. At

the same time, CALD practitioners also act as cultural brokers, overcoming language and cultural barriers, and improving the quality of care offered to various groups of patients. To take cultural and linguistic diversity as its asset, the healthcare system should not only aspire to develop intercultural learning materials specially designed but it should also support and respect the work of various practitioners, which will further help provide culturally responsive care and cultivate a culture of social justice in care [80].

6. Technological and Infrastructure Barriers

6.1 Digital Divide Between Urban and Rural India

The digital divide between urban and rural India is a serious socioeconomic problem that greatly affects access to digital education, health care, and job opportunities. Recent studies in Scopus indicate that India has made considerable progress in digital connectivity, exemplified by initiatives like Reliance Jio's affordable internet packages [81]. However, a substantial gap persists, primarily attributed to socioeconomic disparities and insufficient facilities. The gap isn't just in access; it's also in the quality of digital services. For example, urban areas have greater access to high-speed fiber internet, while rural areas mostly have trouble with slower mobile internet, which limits the full scope of digital participation [82]. Also, it has been discovered that rural populations face more than just a lack of infrastructure, like low digital literacy and digital readiness, which makes it hard for them to utilize online services well, even when they have the tools. Research indicates that practitioners from culturally and linguistically diverse (CALD) backgrounds face numerous challenges, including discrimination, marginalization by professional and institutional cultures, and hierarchical barriers to participation within practice communities [83]. At the same time, Healthcare systems must establish targeted intercultural education programs to leverage cultural and linguistic diversity as an asset [84]. Additionally, they should acknowledge and value the initiatives of various practitioners aimed at promoting culturally appropriate procedures and enhancing equality in care. The challenge of resistance by traditional marketing channels to the healthcare and pharmaceutical industry, as it relates to adopting digital marketing strategies, is still a huge challenge [85]. Recent papers published by Scopus underscore that conventional marketing strategies like print media, television, radio, and community outreach still prevail in some groups of people, especially older people and those in rural areas, hence making it hard to adopt digital platforms that are less recognizable to them [86]. Such resistance can be typically based on the long-standing credibility of traditional channels, the perceived validity of face-to-face communication, and a fear of the ambiguity of the digital transformation that interferes with established professional and patient connections. Moreover, the conventional marketers are often struggling with the inability to comprehend and use digital tools efficiently, which hinders the pace of adoption and introduces internal strains in the organizations between the old and the new [87]. Although the amount spent on digital advertising in the healthcare field is rising, over 70 percent of ad funds are currently channeled to digital media because of its perceived success with regard to the development of trust and familiarity. To overcome such resistance, it is necessary to employ integrated marketing strategies that combine traditional and digital marketing, provide targeted education in order to raise the level of digital literacy among the marketers, and use more adaptable and technology-oriented methods of evaluating outcomes to curb the lack of confidence [88]. It will make sure that the stakeholders are in unison and create an investment environment where the financial and patient-related returns will be measured in a more transparent and systematic way [89].

6.2 Limited Internet Penetration Among Healthcare Professionals

The lack of internet among healthcare professionals is a severe problem when it comes to the extensive implementation of digital health technologies and healthcare delivery modernization [90]. Although the world is witnessing a fast digitalization of the health markets, the recent studies discovered through Scopus indicate that connectivity issues and especially the low-resource environment and remote locations are limiting the ability of many healthcare providers to take full advantage of digital tools to the benefit of patient care, sharing of knowledge and telemedicine [91]. Although the utilization of social media platforms like Facebook, Twitter and LinkedIn has been common among healthcare professionals with studies indicating more than 70 percent adoption among professionals [92], there is a group of clinicians who have barriers to use such platform because of inaccessible reliable internet or sufficient digital infrastructure in their places of work [93]. Moreover, variance in the digital connectivity increases disparities in health care provision because

digitally connected professionals will be able to use telehealth and mobile health applications to access underserved populations more efficiently [93]. In order to address these limitations, it is necessary to invest in powerful and affordable digital infrastructure and train healthcare workers on digital literacy to reduce the digital divide among the healthcare workforce to facilitate the more just use of the transformative technologies [94] .

7. Challenges in Building Brand Credibility Online

Building brand credibility online is a complicated process that is getting harder and harder in the digital world because customers want honesty and openness [95]. Recent studies in the Scopus-indexed database stress how important trust is [95]. A company needs to deal with the absence of confidence that can come from inaccurate data, fake reviews, and problems with confidentiality, which can quickly lead to a loss of confidence [96]. The rapidly evolving digital world, like social media and influencer marketing, places a lot of pressure on brands to be consistent and truthful in their interactions so they don't come across as insincere [97]. Studies also show that new technologies like artificial intelligence (AI) can be both helpful and harmful. For example, brands need to use AI-powered personalization and data analytics to connect with customers without breaking ethical rules and being open about what they do, which can hurt trust [98]. The other very important issue is how to measure and manage digital brand equity. This is because existing metrics may not be enough to understand the complex and changing ways that people interact with and feel about brands online [99], which means that they may not be able to create effective and data-driven branding strategies. To avoid these problems, brands should focus on using AI in an ethical way, telling real stories, and making analytics systems that will help them keep an eye on how honest consumers are acting and feeling and build long-term trust in the digital age [100].

8. Conclusion

In India, pharmaceutical companies have found digital marketing to be an essential part of their business, with some novel means of communicating with healthcare professionals and patients. This study, however, indicates that its implementation has been limited by regulatory, technological, economic and cultural factors. Hardly any flexibility is permitted by strict compliance requirements imposed by frameworks such as the UCPMP 2024 and the DPDP Act 2023, and infrastructural gaps, digital illiteracy, and ineffective ROI measurement remain the barriers to effectiveness. The prevalence of commoditized alternatives and opposition of conventional marketing also pose as an obstacle to brand differentiation. Also, the problem of trust, privacy of data, and cultural diversity makes engagement with patients even more complicated in terms of the Indian heterogenous population.

Nevertheless, the digital transformation is a requirement and inevitability in the sector despite these limitations. As the Indian pharmaceutical market grows very fast, businesses need to strike a balance between compliance and innovation by using advanced technologies like AI-based analytics, multilingual content, and aggregate omnichannel solutions. It is also important to enhance digital literacy and infrastructure and to promote clarity in regulations. Finally, the solutions to these obstacles will allow pharmaceutical companies to embrace the potential of digital marketing to the fullest, promote in an ethical manner, improve patient trust, and sustain the business even in the environment where healthcare is integrated into an even more competitive ecosystem.

Abbreviations:

HCP: Health Care Provider
MR: Medical Representative
UCPMP: Uniform Code for Pharmaceutical Marketing Practices
CRM: Customer Relationship Management
AI: Artificial Intelligence
AR: Augmented Reality
VR: Virtual Reality
SEO: Search Engine Optimization
TPG: Telemedicine Practice Guidelines
RMP: Registered Medical Practitioner
API: Active Pharmaceutical Ingredient
EMR: Electronic Medical Record
CALD: Culturally and Linguistically Diverse
DPDP Act: Digital Personal Data Protection Act
ROI: Return on Investment

Funding: None.

Conflict of interest: Authors have no conflict of interest.

Acknowledgments:
None

Reference

1. Sonawane, S., V. Mahajan, and A. Dhavan, *EFFECT OF DIGITAL MARKETING ON PHARMACEUTICAL BUSINESS AND ITS*

IMPACT ON SOCIAL WELLBEING-A CONCEPTUAL REVIEW. The Online Journal of Distance Education and e-Learning, 2023. **11**(2).
2. Sharma, K., *The impact of e-commerce on operational cost efficiency in modern businesses.* Sachetas, 2024. **3**(3): p. 56-62.
3. Chiplunkar, S., D. Gowda, and H. Shivakumar, *Adaptation of pharmaceutical marketing and drug promotion practices in times of pandemic COVID-19.* International Journal of Health & Allied Sciences, 2020. **9**(5): p. 11-11.
4. Dalal, S. and Rakshit, *Navigating the Digital Era: Key Skills and Insights for Digital Entrepreneurs in Unorganized Sector*, in *Entrepreneurship in India's Unorganized Sector: Challenges and Opportunities*. 2025, Springer. p. 137-151.
5. Pathak, R., et al., *Pharma Marketing in India: Prospects and Challenges.* Pharma Marketing and Pharmacoeconomics, 2024: p. 295-329.
6. Sakhare, S.A., et al., *Research on Pharmaceutical Sales and Marketing.* International Journal of Sciences and Innovation Engineering, 2025. **2**(5): p. 1150-1172.
7. Ilin, D.V. and I.V. Lazanyuk, *Indian pharmaceutical market: a way towards leadership in generics.* RUDN Journal of Economics, 2024. **32**(4): p. 725-743.
8. Fatima, T., *Information Technology Law in India.* 2023.
9. Cherian, J.J., et al., *India's road to independence in manufacturing active pharmaceutical ingredients: focus on essential medicines.* Economies, 2021. **9**(2): p. 71.
10. SERIES, A.T.-H.R., *US-India Economic Ties: To the Next Level and Beyond.* 2024.
11. Raghupathi, V. and W. Raghupathi, *Healthcare expenditure and economic performance: insights from the United States data.* Frontiers in public health, 2020. **8**: p. 156.
12. Gupta, P., et al., *Antecedents of Pharmaceutical Digital Marketing Challenges and opportunities: A Descriptive Research Design.* Journal of Pharmaceutical Negative Results¦ Volume, 2023. **14**(3): p. 1816.
13. Κυρτσίδου, A.X., *Navigating the digital disruption: agile strategies for regulated global industries in the era of rapid technological changes in international business.* 2024.
14. Aaker, D.A. and C. Moorman, *Strategic market management*. 2023: John Wiley & Sons.
15. Abomusallam, A.S., *Digital customer engagement: how can pharmaceutical organizations create better value?* 2023, University of Warwick.
16. Ngamvichaikit, A., *Leveraging design thinking for pharmaceutical digital marketing.* Asian Journal of Business Research, 2021. **11**(1): p. 120-140.
17. Dingre, S., et al., *Integrating artificial intelligence in pharmaceutical marketing: Enhancing engagement and efficiency.* 2025.
18. Sugandha, S., et al., *Role of digital transformation and technology adoption in the efficiency of the pharmaceutical industry.* European Chemical Bulletin, 2023. **12**(5): p. 6862-6874.
19. Fernandes, A.F.R., *Digital Transformation in the Pharmaceutical Industry: A Case Study on the Portuguese Neurology Sector*. 2021, Universidade Catolica Portuguesa (Portugal).
20. Vashishth, T.K., et al., *Embracing AI and Machine Learning for the Future of Digital Marketing*, in *AI, Blockchain, and Metaverse in Hospitality and Tourism Industry 4.0*. 2024, Chapman and Hall/CRC. p. 90-117.
21. Taylor, J., *Digital tools, rhetoric, and meaning-making: A critical exploration of addressing the digital divide and accessibility to improve our digital landscape*. 2023: Iowa State University.
22. Greene, R., *Developing an Online Health Community for Autoimmune Disease Patients Through Self-Managed Diet.* 2020.
23. Freberg, K., *Social media for strategic communication: Creative strategies and research-based applications*. 2021: Sage Publications.
24. Boppana, V.R., *Future Trends in Cloud-based CRM Solutions for Healthcare.* Available at SSRN 5004929, 2023.
25. Rathore, Y.K., N. Dewangan, and S.K. Swarnkar, *Comprehensive Approaches to Pharmaceutical Marketing: Balancing Innovation and Regulation.* Research Journal

of Pharmacy and Technology, 2024. **17**(11): p. 5480-5484.
26. Saha, S.K., et al., *Impact of Benefits on Preference for Traditional Detailing*, in *Advances in Communication, Devices and Networking: Proceedings of ICCDN 2021*. 2022, Springer. p. 137-143.
27. Castillo, A.J. and E. Dimaculangan, *Factors Influencing Physicians in the Adoption of e-Detailing in the in-vitro Diagnostic Industry.* Available at SSRN 4617137, 2024.
28. Clark, R.C., *Evidence-based training methods: A guide for training professionals*. 2019: Association for Talent Development.
29. Srivastav, A. and A. Sharma, *Healthcare Platform for Online Consultation.* 2022.
30. Adekuajo, I.O., et al., *Crisis marketing in the FMCG sector: A review of strategies Nigerian brands employed during the COVID-19 pandemic.* International Journal of Management & Entrepreneurship Research, 2023. **5**(12): p. 952-977.
31. Sheikh, A., et al., *Health information technology and digital innovation for national learning health and care systems.* Lancet Digit Health, 2021. **3**(6): p. e383-e396. https://doi.org/10.1016/S2589-7500(21)00005-4
32. Pandya, A., M. Waller, and J.M. Portnoy, *The regulatory environment of telemedicine after COVID-19.* The Journal of Allergy and Clinical Immunology: In Practice, 2022. **10**(10): p. 2500-2505.
33. Chaudhary, U., et al., *Unleashing the Power of Wireless Communication in Healthcare by Empowering Patient Care and Connectivity: A Comprehensive Survey.* IEEE Access, 2025.
34. Tipre, M., et al., *Attitudes toward telemedicine among urban and rural residents.* Journal of Telemedicine and Telecare, 2024. **30**(4): p. 722-730.
35. Wang, R., et al., *Online dialogue with medical professionals: An empirical study of an online "Ask the Doctor" platform.* International Journal of Medical Informatics, 2023. **177**: p. 105123.
36. Singh, K., P. Rana, and R. Sandhu, *E Pharmacy.* 2022.
37. Sireesha, B. and S. Haritha, *A review on regulatory affairs and regulatory requirements for new drug approval.* International Journal of Health Care and Biological Sciences, 2024: p. 22-28.
38. Kulkarni, G.R., et al., *Digital health innovation: Emergence of digital medical consumer (DMC) and holistic digital health Start-Ups (HDHSs)*, in *Indian SMEs and Start-Ups: Growth through Innovation and Leadership*. 2023, World Scientific. p. 203-226.
39. Subbiah, V., *The next generation of evidence-based medicine.* Nat Med, 2023. **29**(1): p. 49-58. https://doi.org/10.1038/s41591-022-02160-z
40. Awwal-Bolanta, O., *Regulation of Misleading Advertisement and the Effect of Disclaimer of Truth in Advertisement.*
41. Goirand, M., E. Austin, and R. Clay-Williams, *Bringing clarity and transparency to the consultative process underpinning the implementation of an ethics framework for AI-based healthcare applications: a qualitative study.* AI and Ethics, 2024: p. 1-21.
42. Singh, P. and S. Absar, *Comparative Privacy Legislation: Indian and European Personal Data Protection Legislation in the Digital Age.* Journal of Legal Studies, 2021. **3**: p. 78-92.
43. Jain, T., *Relevance of Claimant's Blemished Conduct: New Juridical Expositions on Contests Against State.* SCC Online Blog, 2022.
44. Shaikh, S., et al., *Compliance Tools to Assist the Drug Industry for Regulatory Audits from Developed Countries*, in *Modern Aspects of Pharmaceutical Quality Assurance: Developing & Proposing Application models, SOPs, practical audit systems for Pharma Industry*. 2024, Springer. p. 73-91.
45. Sawad, A.B. and K. Andrews, *Marketing training strategies that pharmaceutical sales managers use to reduce unethical behavior.* Journal of Education and Health Promotion, 2022. **11**(1): p. 202.
46. Friske, W., S.A. Hoelscher, and A.N. Nikolov, *The impact of voluntary sustainability reporting on firm value: Insights from signaling theory.* Journal of the Academy of Marketing Science, 2023. **51**(2): p. 372-392.
47. Frenk, J., et al., *Challenges and opportunities for educating health professionals after the*

COVID-19 pandemic. Lancet, 2022. **400**(10362): p. 1539-1556. https://doi.org/10.1016/S0140-6736(22)02092-X

48. Laskar, M.H., *Examining the emergence of digital society and the digital divide in India: A comparative evaluation between urban and rural areas.* Frontiers in Sociology, 2023. **8**: p. 1145221.
49. Gupta, S., A. Verma, and D. Singh, *Role of ICT in Good Health and Well-Being*, in *Green Computing for Sustainable Development*. 2025, Auerbach Publications. p. 85-104.
50. Ezeudoka, B.C. and M. Fan, *Exploring the impact of digital distrust on user resistance to e-health services among older adults: the moderating effect of anticipated regret.* Humanities and Social Sciences Communications, 2024. **11**(1): p. 1-19.
51. Newton, G.S., *Addressing the Decline in Clinical Interactions Due to Continuous Change in Health Consumer Digital Health Behaviours–A Clinician and Health Consumer Action Research Design*. 2022: The University of Liverpool (United Kingdom).
52. Kasoju, N., et al., *Digital health: trends, opportunities and challenges in medical devices, pharma and bio-technology.* CSI Transactions on ICT, 2023. **11**(1): p. 11-30.
53. Samajdar, S.S., et al., *Navigating the Digital Personal Data Protection (DPDP) Rules, 2025: Implications for Healthcare and Medical Research in India.* Bengal Physician Journal, 2025. **12**(3): p. 109-111.
54. Khan, B., et al., *Drawbacks of artificial intelligence and their potential solutions in the healthcare sector.* Biomedical Materials & Devices, 2023. **1**(2): p. 731-738.
55. Policy, B.o.H.S. and C.o.S.f.R.S.o.C.T. Data, *Sharing clinical trial data: maximizing benefits, minimizing risk.* 2015.
56. Mandinach, E.B. and E.S. Gummer, *The ethical use of data in education: Promoting responsible policies and practices*. 2021: Teachers College Press.
57. Priya, M., et al., *AN OVERVIEW ON CLINICAL DATA MANAGEMENT AND ROLE OF PHARM. D IN CLINICAL DATA MANAGEMENT.* World Journal of Advanced Pharmaceutical and Medical Research, 2024. **10**: p. 299.
58. Naik, S., *Cloud-Based Data Governance: Ensuring Security, Compliance, and Privacy.* The Eastasouth Journal of Information System and Computer Science, 2023. **1**(01): p. 69-87.
59. Mitra, S. and S.K. Dawn, *THE DYNAMICS OF ETHICAL PRACTICES IN DIGITAL MARKETING: A STATISTICAL EXPLORATION.* Tec Empresarial, 2025. **7**(1): p. 675-698.
60. Pandey, P. and R. Litoriya, *Implementing healthcare services on a large scale: challenges and remedies based on blockchain technology.* Health Policy and Technology, 2020. **9**(1): p. 69-78.
61. Bhaskar, S., et al., *Telemedicine Across the Globe-Position Paper From the COVID-19 Pandemic Health System Resilience PROGRAM (REPROGRAM) International Consortium (Part 1).* Front Public Health, 2020. **8**: p. 556720. https://doi.org/10.3389/fpubh.2020.556720
62. Saldanha, T., *Why digital transformations fail: The surprising disciplines of how to take off and stay ahead*. 2019: Berrett-Koehler Publishers.
63. Adak, S., *Impact of covid-19 on the active pharmaceutical ingredient supply chain.* Universal Journal of Pharmacy and Pharmacology, 2024: p. 6-9.
64. Ugodnikov, A., H. Persson, and C.A. Simmons, *Bridging barriers: advances and challenges in modeling biological barriers and measuring barrier integrity in organ-on-chip systems.* Lab Chip, 2024. **24**(13): p. 3199-3225. https://doi.org/10.1039/d3lc01027a
65. Tiruwa, A. and S. Dikshit, *Building Sustainable Futures: Cross-Sector Partnerships for Capacity Building under SDG 17*. Available at SSRN 5317795, 2025.
66. Chahal, B.P.S., U. Sharma, and B. Bansal, *Innovative Financing Models and Future Directions in Healthcare: Evaluating the Impact of Financial Strategies on Digital Health Outcomes and Innovation*, in *Driving Global Health and Sustainable Development Goals With Smart Technology*. 2025, IGI Global Scientific Publishing. p. 267-302.

67. Watson, D.E., et al., *A results-based logic model for primary health care: laying an evidence-based foundation to guide performance measurement, monitoring and evaluation.* 2004.
68. Tayefi, M., et al., *Challenges and opportunities beyond structured data in analysis of electronic health records.* Wiley Interdisciplinary Reviews: Computational Statistics, 2021. **13**(6): p. e1549.
69. Morsi, I., et al., *Optimizing Healthcare Programs: A Comparative Analysis of Agile and Traditional Management Approaches.* medRxiv, 2024: p. 2024.07. 16.24310351.
70. Cavaller-Bellaubi, M., et al., *Sustaining Meaningful Patient Engagement Across the Lifecycle of Medicines: A Roadmap for Action.* Ther Innov Regul Sci, 2021. **55**(5): p. 936-953. https://doi.org/10.1007/s43441-021-00282-z
71. Proença, M.H.D., *The application of social media for marketing strategies in pharma healthcare*. 2021, ISCTE-Instituto Universitario de Lisboa (Portugal).
72. Doctor, E., *Navigating Human Behavior for the Successful Digital Transformation of the Healthcare Sector*. 2025.
73. Sharma, S., *Repetitive Financial Ads on Social Media Shape Next-Gen Future Financial Experience: Why Financial Experts Should be Alert?* 2024, Concordia University.
74. Kaufman, I., C. Horton, and M. Soltanifar, *Digital Marketing: Integrating Strategy, Sustainability, and Purpose*. 2023: Routledge.
75. Bowman, J.M., *Digital Marketing and the Culture Industry: The Ethics of Big Data*. 2021: University of Arkansas.
76. Lu, R., *Examining provider perspectives surrounding cultural competencies: An integrative review.* Nurse Educ Pract, 2025. **82**: p. 104242. https://doi.org/10.1016/j.nepr.2024.104242
77. Joo, J.Y. and M.F. Liu, *Culturally tailored interventions for ethnic minorities: A scoping review.* Nurs Open, 2021. **8**(5): p. 2078-2090. https://doi.org/10.1002/nop2.733
78. Ben-Arye, E., et al., *Cross-cultural patient counseling and communication in the integrative medicine setting: Respecting the patient's health belief model of care.* Current psychiatry reports, 2024. **26**(8): p. 422-434.
79. Simpson, P., et al., *Becoming confidently competent: a qualitative investigation of training in cognitive functional therapy for persistent low back pain.* Physiother Theory Pract, 2024. **40**(4): p. 804-816. https://doi.org/10.1080/09593985.2022.2151333
80. Mathur, S.K. and K.A. Rodriguez, *Cultural Responsiveness Curriculum for Behavior Analysts: A Meaningful Step Toward Social Justice.* Behav Anal Pract, 2022. **15**(4): p. 1023-1031. https://doi.org/10.1007/s40617-021-00579-3
81. Zhang, L. and D. Hu, *National digital development strategy and its practice in India*, in *Countries and Regions: Dynamic Interconnectivity*. 2024, Springer. p. 137-181.
82. Tarnoff, B., *Internet for the people: The fight for our digital future*. 2022: Verso Books.
83. Harris, M., et al., *The experiences of culturally and linguistically diverse health practitioners in dominant culture practice: a scoping review.* Adv Health Sci Educ Theory Pract, 2025. **30**(2): p. 613-643. https://doi.org/10.1007/s10459-024-10359-7
84. Olaniyan, M.F. *QUALITY HEALTHCARE AND CULTURAL DIVERSITY IN ADVANCING SUSTAINABLE DEVELOPMENT GOALS (SDGS)*. in *Cultural Odyssey: 20 Years of Implementation of UNESCO's 2005 Convention in Nigeria*.
85. Khiong, K., *Impact and Challenges of Digital Marketing in Healthcare Industries during Digital Era and Covid-19 Pandemic.* Journal of Industrial Engineering & Management Research, 2022. **3**(5): p. 112-118.
86. Kanchan, S. and A. Gaidhane, *Print Media Role and Its Impact on Public Health: A Narrative Review.* Cureus, 2024. **16**(5): p. e59574. https://doi.org/10.7759/cureus.59574
87. Akpan, U.A., et al., *Community Broadcasting and Rural Health Care Delivery in Nigeria: Finding the Nexus.* International Journal of Sustainable Social Science, 2025. **3**(2): p. 115-132.
88. Trisninawati, T. and D. Sartika, *Digital literacy model to improve the marketing skills of micro, small, and medium*

enterprises women with a community-based educational approach. JPPI (Jurnal Penelitian Pendidikan Indonesia), 2024. **10**(2): p. 952-960.

89. Monroe, R. and J. Schnippert, *Utilizing a Nurse-Initiated Phone Call to Improve Pain Control in Neurosurgical Patients.* 2024.
90. Wang, Q., et al., *Integrating digital technologies and public health to fight Covid-19 pandemic: key technologies, applications, challenges and outlook of digital healthcare.* International Journal of Environmental Research and Public Health, 2021. **18**(11): p. 6053.
91. Lamichhane, B. and N. Neupane, *Improved healthcare access in low-resource regions: A review of technological solutions.* arXiv preprint arXiv:2205.10913, 2022.
92. Guerra, F., et al., *The use of social media for professional purposes by healthcare professionals: the# intEHRAct survey.* EP Europace, 2022. **24**(4): p. 691-696.
93. Botelho, F.H.F., *Accessibility to digital technology: Virtual barriers, real opportunities.* Assist Technol, 2021. **33**(sup1): p. 27-34. https://doi.org/10.1080/10400435.2021.1945705
94. Socha-Dietrich, K., *Empowering the health workforce to make the most of the digital revolution.* OECD Health Working Papers, 2021(129): p. 0_1-67.
95. More, A.B., *Implementing digital age experience marketing to make customer relations more sustainable*, in *New Horizons for Industry 4.0 in modern business*. 2023, Springer. p. 99-119.
96. Shukla, A.D. and J.M. Goh, *Fighting fake reviews: Authenticated anonymous reviews using identity verification.* Business Horizons, 2024. **67**(1): p. 71-81.
97. Kunert, A.N., *The Authenticity Imperative-Towards Building Long-Term Relationships with Social Media Influencers in the Digital Age.* 2023.
98. Kuma, B., *AI-Powered Marketing: Predictive Consumer Behavior and Personalized Campaigns.* 2025.
99. France, S.L., N.S. Davcik, and B.J. Kazandjian, *Digital brand equity: The concept, antecedents, measurement, and future development.* Journal of Business Research, 2025. **192**: p. 115273.
100. Skillius, E. and A. Jacobsson, *Beyond the Algorithm-How AI-Driven Personalized Ads Shape Consumer Loyalty and Brand Engagement.* 2024.