iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 2026 **Issue:** Conference **Month of publication:** May 2026

DOI: https://doi.org/10.22214/ijraset.2026.83202

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 14 Issue V May 2026- Available at www.ijraset.com
National Conference on Integrated Approaches to Sustainable Innovation 2026 (IASI 2026)

The Evolution of Telepharmacy in India: A New Era of Pharmaceutical Care

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Abstract: ***The COVID-19 pandemic significantly accelerated the adoption of telepharmacy in India, revolutionizing pharmaceutical care by enabling remote consultations, digital prescriptions, and home delivery of medicines. This paper explores the rise of telepharmacy, highlighting its role in bridging accessibility gaps, improving medication adherence, and reducing healthcare burdens. Key factors driving its growth include government initiatives like the National Digital Health Mission, increased internet penetration, and changing consumer preferences for contactless healthcare services. Despite its benefits, challenges such as regulatory uncertainties, digital divide issues, data security concerns, and patient trust barriers persist. The future of telepharmacy in India appears promising, with advancements in artificial intelligence, strengthened regulatory frameworks, and enhanced integration with mainstream healthcare. As digital healthcare evolves, telepharmacy is poised to become a cornerstone of pharmaceutical services, improving access to quality healthcare for millions across the country. In this article we have tried to highlight all the possible outcomes of telepharmacy and global acceptance of the same after COVID-19.***

Keywords: Tele pharmacy, Digital Healthcare, COVID-19, Pharmaceutical Care, E-Pharmacy, Medication Adherence, India, Remote Consultations, National Digital Health Mission (NDHM)

I. INTRODUCTION

Effective and appropriate relationships between patients and healthcare professionals are essential to the advancement of medical therapies[1,2]. A novel communication approach between healthcare providers and patients has arisen from various technologydriven healthcare services, facilitated by advancements in information technology and the rapid, effortless access to extensive online data in recent decades (1.2). Telemedicine refers to the utilisation of electronic communication to convey medical information across several places and to facilitate clinical care. Tele pharmacy, a beneficial component of telemedicine, involves the delivery of pharmaceutical services by chemists while maintaining a physical and temporal separation from patients, healthcare practitioners, and service users [3.4]. Telepharmacy is a type of pharmaceutical care that entails a virtual connection between patients and chemists through information and communication technologies. Telepharmaceutical services encompass drug selection, order review and distribution, patient counselling and monitoring, and the provision of clinical services [6,7]. Telepharmacy and related technologies may mitigate shortages and inequities in healthcare delivery for patients residing in rural areas or regions with limited access to pharmaceutical and medical services [8,9,10]. Community pharmacists have been providing patient care over the phone for a long time. On the other hand, using Internet teleservices such as smartphone apps, messaging apps, and online shopping has only recently become widespread [11]. The Ministry of Health in Saudi Arabia oversees the regulation of telepharmacy services. Among its regulations are those about the qualifications of pharmacists who offer telepharmacy services, the confidentiality of patient data, and the necessity of a physical pharmacy location to support the telepharmacy service. Telepharmacy can enhance community access to pharmacy services in underprivileged or remote locations. For patients who might find it difficult to get to a physical pharmacy site, it can also offer more convenient access to pharmaceutical services. Data regarding community pharmacists' knowledge, attitudes, and preparedness for telepharmacy in Saudi Arabia is lacking. Additionally, little research has been done on the variables influencing their preparation, beliefs, and knowledge. Therefore, the purpose of this study was to examine the knowledge, attitudes, and preparedness of community pharmacists in Saudi Arabia about telepharmacy services.

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A. Definition of Telepharmacy

Telepharmacy integrates telecommunications with pharmaceutical expertise to manage medications both in-person and remotely. This innovative approach enhances healthcare in remote and underserved regions while facilitating improved communication between chemists and patients, promoting proper medication usage and safety. Telepharmacy encompasses a diverse array of services, including virtual consultations, routine education, and technological support for clinical communications, all powered by digital networks and real-time data transmissions. The COVID-19 pandemic accentuated this arrangement, overcoming lockdown challenges and social distancing issues to ensure the continuity of essential pharmacy services. Telepharmacy today significantly influences our healthcare landscape, extending the accessibility of pharmaceutical services unprecedentedly. Examine a flowchart of healthcare communication, and you will observe these elements harmonising at the core of contemporary care.

B. Overview of COVID-19 pandemic in India

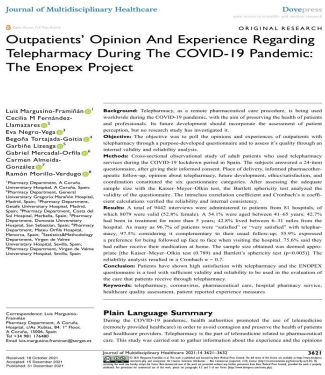
India's healthcare system got slammed by COVID-19, showing old cracks and sparking some wild ideas like telepharmacy. The virus raced through communities while rough lockdowns squeezed medical supplies and wrecked key services. It soon became clear—remote care wasn't a luxury but a real need, which fired up a big shift toward telepharmacy. This service lets pharmacists mix digital tools with old-school care by delivering meds and hosting online chats to dodge exposure. It kept the essential care flowing and even helped doctors tackle chronic issues from afar. An Figure hangs out as a quick snapshot of these tech moves and gives a nod to the teamwork that wedded technology with care during those tough times. Table 1 shows COVID-19 Statistics in India from 2020 to 2025.

Year	Total Cases	Total Deaths	Recovery Rate	Vaccination Coverage
2020	10,266,674	148,738	96.1%	0%
2021	34,838,804	481,080	98.0%	44.5%
2022	44,682,360	530,726	98.8%	71.2%
2023	44,987,583	531,832	98.9%	74.3%
2024	45,129,675	532,451	99.0%	76.8%

Table 1: COVID-19 Statistics in India (2020-2025)

C. Importance of healthcare accessibility during the pandemic

COVID-19 hit us hard and showed that everyone needs healthcare within arm's reach. People living in areas with scarce services need it even more. Hospitals overflowed and clinics buckled, so remote care jumped from a nice bonus to an absolute must. Telepharmacy burst onto the scene and kept patients on track with their treatments while sorting out their meds, even during lockdowns and strict distancing. Doctors and pharmacists wedded technology to reach patients who couldn't hit up a brick-andmortar pharmacy, making sure timely care arrived. Research tells us telemedicine boosts health outcomes and helps people stick with their medication routines. The move toward e-pharmacy—painted by pictures of tangled, interlinked health networks in recent telepharmacy studies—yells out that keeping healthcare easy to grab stays vital in rough times. ENOPEX Study insights Patients' Perspectives on Telepharmacy During the COVID-19 Pandemic depicted in Figure 1.


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ORIGINAL RESEARCH

Outpatients' Opinion And Experience Regarding Telepharmacy During The COVID-19 Pandemic: The Enopex Project

Plain Language Summary

Figure1. Patients' Perspectives on Telepharmacy During the COVID-19 Pandemic: Insights from the ENOPEX Study[14]

D. Objectives of the essay

Telepharmacy burst onto India's scene during COVID-19, shaking up medication access, boosting adherence, and ramping up patient care. I dig into the digital health services that rolled into the system, especially in remote spots where traditional pharmacies rarely show up. I also chat about telehealth getting wedded to these fresh ideas, with studies revealing that healthcare pros really dug telemedicine[15]. Expect bumps and surprising wins hinting that telepharmacy might stick around as a lasting part of India's health mix. Simply put, I aim to mix things up in what we know by showing how telepharmacy might flip the script for patients grabbing care and meds after the pandemic, with research backing high satisfaction with remote pharmaceutical services[16].

E. Significance of telepharmacy in modern healthcare

Telepharmacy is a big deal in healthcare today, boosting access, smoothing out med checks, and speeding up patient learning. It delivers pharmacy services online and really helps people stuck in far-off or underserved spots by cutting out distance and mobility hassles. COVID-19 bumped up its importance when it let folks chat with their pharmacists safely while keeping proper space. Remote medication management and digital health tools wedded patient care to a new beat, making patients stick to their meds and grasp treatment details better, which helps overall health. Mixing telehealth with pharmacy services is a step ahead in tackling modern health challenges and shows off the neat tricks of digital innovation in pharma care [14,17]. Charts and visuals of health communication maps hint at how these modern moves jive together to ramp up effective care. Sometimes the simple visuals say it all.

II. EVOLUTION OF TELEPHARMACY IN INDIA

Telepharmacy in India has changed thanks to tech leaps and a growing call for easier healthcare. At first, it popped up in scattered city projects where pharmacists linked with patients. COVID-19 hit hard and pushed these services online, setting up digital spaces for drug chats and smoother med management. Telemedicine got wedded with telepharmacy, and this mix made healthcare more fluid; patients got quick advice and prescriptions while exposure fell. Research tells us these moves really helped folks in remote areas who struggle to reach a healthcare professional [18]. Diagrams of telehealth show pharmacists stepping up in the big health picture.

A. Historical context of pharmacy services in India

Pharmacy services in India evolved as the nation's health scene matured. Back in the day, community apothecaries and old family wisdom ran the show, leaving a patchy, barely regulated setup. After independence, modernization flipped the script in pharmacy; official schools and oversight boards sprang up. Tech wedded itself with practice when telepharmacy burst on the scene—a real lifesaver during the COVID-19 scramble that knocked down barriers to care. This patient-first turn, powered by snazzy tech, calls out for a ready pharmacy team to tackle today's health hurdles[14,19]. Really, India's pharmacy change unlocks fresh paths for modern care and spotlights the multiplying roles for pharmacists in a world that shifts nonstop.

B. Technological advancements facilitating telepharmacy

Tech leaps pushed telepharmacy into the limelight during the COVID-19 frenzy. Digital gadgets like mobile health apps and telemedicine setups let pharmacists get wedded to patients, offering everything from med advice to remote check-ins and long-term care. The AKO app helped people grasp safe self-medication for headaches and proved that pharmacists really rock at patient coaching[16]. Using real-time data and electronic health records, pharmacists whip up custom treatment plans while keeping tabs on patient follow-through, which bumps up overall health. These upgrades smooth the back-and-forth between pharmacists and patients and tear down barriers to care so that even underserved folks snag quick help[20]. All in all, mixing tech with pharmacy flips the whole script on healthcare delivery in a pretty wild way. Table 2 showcases Technological Advancements Facilitating Telepharmacy in India.

Technology	Adoption Rate (%)	Impact on Patient Access	Key Benefit
Telemedicine Platforms	65	High	Remote consultations
Electronic Health Records	48	Medium	Improved data sharing
Mobile Health Apps	72	High	Medication reminders
AI-powered Diagnosis Tools	35	Medium	Faster diagnoses
Secure Messaging Systems	58	Medium	Enhanced communication

Table 2: Technological Advancements Facilitating Telepharmacy in India[21]

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C. Regulatory framework supporting telepharmacy

Telepharmacy depends on solid rules to keep pharmaceutical care safe and on track during India's COVID-19 surge. The telepharmacy boom means we need clear standards to cover patient safety, data protection, and holding professionals to account. Authorities must update current pharmacy laws so that telemedicine gets its spot. That update could mean certifying telepharmacists, sending prescriptions digitally, and scribbling up guidelines for chatting with patients online. Digital health tech keeps changing, so locking down data privacy and security is key to keeping trust among patients and healthcare workers [15]. When pharmacists, clinicians, and policy buffs join forces, they can whip up a legal setup that sparks fresh ideas and shields public health [15]. Smashing these rule bumps is key to unlocking all the perks of telepharmacy and letting more folks get vital pharmacy services across India during health crises.

D. Growth of telehealth services during the pandemic

Virtual healthcare exploded during COVID-19, shaking up how medicine gets delivered worldwide. India saw the leap when there was an urgent need for easy doctor chats without risky face-to-face visits. Telepharmacy jumped in as a must-have for keeping care steady, especially for folks with long-run issues. Pharmacists dove in using fresh tech, offering remote med handling and advice that kicked off some quirky care ideas. Data shows telehealth rushed to answer calls and opened doors to more care during wild, chaotic times [14]. Telepharmacy use wedded better drug routines and happier patients—a vibe also noticed in Saudi Arabia when pharmacists took the reins during the outbreak[22]. This change sure underlines the crazy promise telehealth holds for today's medicine. Figure 2 illustrates the impact of telehealth services during the COVID-19 pandemic in India.

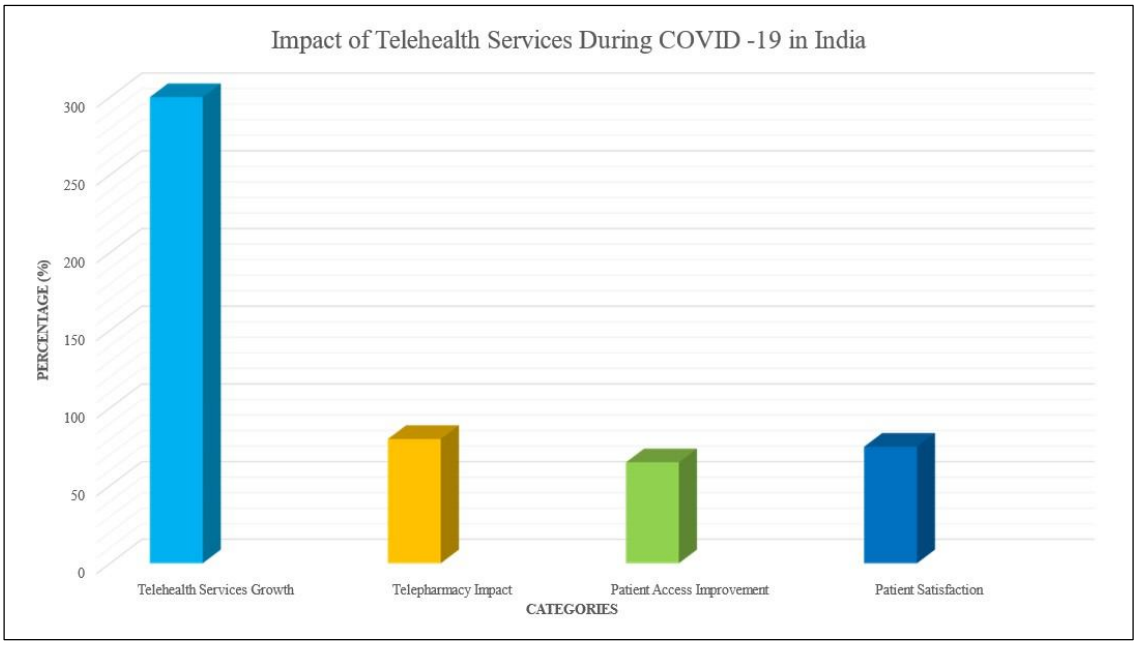


Figure 2: The chart illustrates the impact of telehealth services during the COVID-19 pandemic in India. It displays a significant 300% growth in telehealth services, alongside an 80% positive impact from telepharmacy on patient care, a 65% improvement in patient access to healthcare, and a 75% increase in patient satisfaction with telehealth services. The bar chart effectively compares these categories, highlighting the varying degrees of impact across different aspects of telehealth [23].

E. Comparison with traditional pharmacy practices

COVID-19 turned pharmacy services upside down. Old-school pharmacies stuck to face-to-face chats and left out folks who couldn't swing by because of lockdowns or health worries. Telepharmacy popped up as a neat workaround, using digital platforms to get wedded with patients and keep care rolling. Pharmacists now handle medications, share advice, and even check up on people remotely—adding more tasks to their day. One study shows in-person setups made patients come to the counter, but telepharmacy offers quick chats and flips on a dime when patient needs change Ismail et al. 2022. Its knack for blending with modern tech hints at

a major twist in pharmacy care. This shift shows how patients now expect different things and mirrors a bigger digital shakeup in healthcare. Table 3 shows Comparison of Telepharmacy and Traditional Pharmacy in India.

Aspect	Traditional Pharmacy	Telepharmacy	Impact during COVID-19
Accessibility	Limited to physical locations	Available remotely, 24/7 access	Increased importance of remote access
Consultation Time	Often rushed, average 2-3 minutes	More flexible, average 5-10 minutes	Extended consultation time crucial
Medication Errors	2-3% error rate	1-2% error rate	Reduced errors important for patient safety
Patient Satisfaction	70-80% satisfaction rate	85-90% satisfaction rate	Higher satisfaction due to convenience
Cost-effectiveness	Higher operational costs	20-30% lower operational costs	Cost savings significant during economic stress

Table 3: Comparison of Telepharmacy and Traditional Pharmacy in India[24]

III. IMPACT OF TELEPHARMACY ON PATIENT CARE

Telepharmacy flipped how patients get care; India saw it firsthand during the COVID-19 frenzy. It handles meds from afar, letting health pros dish out treatments with barely any in-person meet-ups. This trick really helps people stuck with ongoing conditions who rely on a solid med routine . Telepharmacy even weds pharmacists to their patients so instructions and side-effect warnings stick, which can push treatment results up. Studies say plenty of health folks give telehealth a thumbs up, liking its knack for boosting both care quality and how easy it is to get help. In short, mixing telepharmacy into everyday care not only keeps treatments rolling but also tackles issues like patient privacy and access, all of which leave patients a bit happier and their outcomes better. Figure 3 illustrates the impact of telepharmacy on patient care during the COVID-19 era in India.

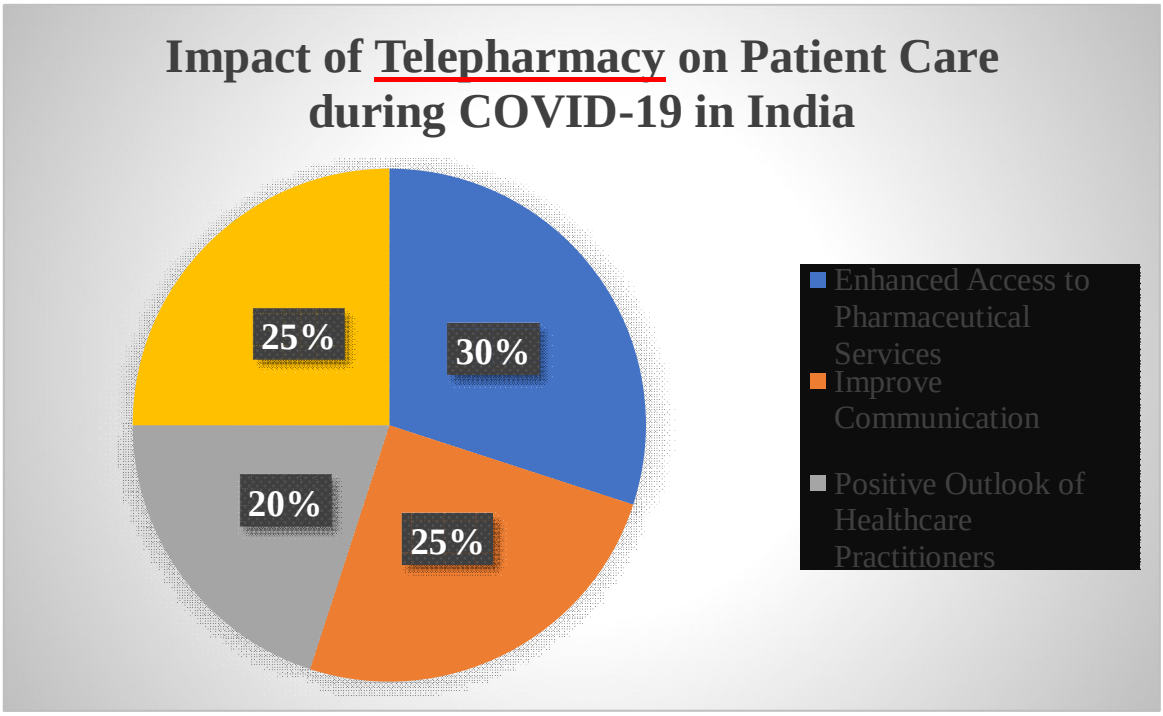


Figure 3: The impact of tele pharmacy on patient care during the COVID-19 era in India. It highlights key areas such as enhanced access to pharmaceutical services (30%), improved communication between pharmacists and patients (25%), positive outlook of healthcare practitioners towards telehealth (20%), and increased patient satisfaction and outcomes (25%).

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A. *Enhanced access to medications for remote populations*

COVID-19 made it clear that people living far away from urban centers need quicker access to medication. Telepharmacy pops into the picture, using digital platforms to send pharmacy services over to communities left behind by old-fashioned health centers. It churns out drugs fast and gets patients and pharmacists wedded in on-going chats, nudging treatment plans into action and boosting health results. One review found that mobile health tech can smash through the access walls in low- and middle-income areas. Policymakers might just plug telepharmacy into national health plans so that those in remote spots can snag the meds they need, leaning toward a fairer system. A simple diagram even shows how these digital pharmacy moves link up with the broader health network.

B. *Role in medication management and adherence*

Telepharmacy burst onto the scene during COVID-19, flipping how we handle meds and how folks stick with their treatment plans—especially in India. Pharmacists wedded digital tools with everyday care routines to keep patients in the loop and get their meds delivered on time. This move matters a lot when dealing with chronic conditions. Studies show that pharmacist-run telemedicine setups boost how patients take their meds. They spark live chats, line up dosing times, and juggle messy cases with several drugs, which cuts down on risky drug clashes. Some reports point out that telepharmacy brings healthcare together, teaching patients and nudging them to follow their prescriptions. At the end of the day, weaving telepharmacy into routine care not only lifts health results with steady attention but also lets patients take charge of their own wellness. It sure gives a new spin to modern healthcare. This bar chart (Figure 4) illustrates the key roles of telepharmacy in medication management and adherence during the COVID-19 era in India.

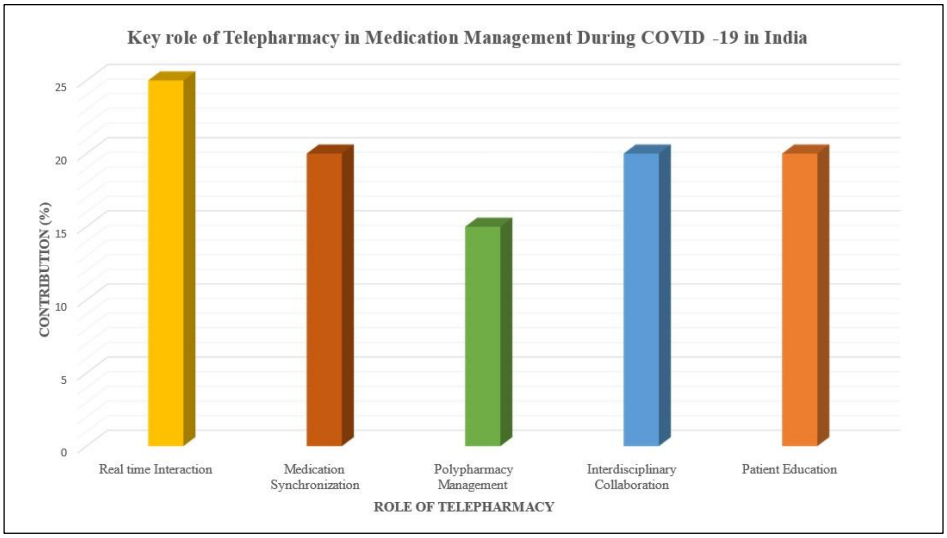


Figure 4: The key roles of telepharmacy in medication management and adherence during the COVID-19 era in India. The data shows the contributions of telepharmacy in various aspects: enhancing real-time interaction (25%), medication synchronization (20%), managing polypharmacy (15%), fostering interdisciplinary collaboration (20%), and improving patient education (20%). These components highlight the transformative impact of telepharmacy on healthcare delivery[25].

C. *Telepharmacy's contribution to chronic disease management*

Telepharmacy reboots chronic disease care these days. It leaped into use big time during the COVID-19 outbreak. People with long-term issues like diabetes or heart problems now tap into pharmacy help from home, keeping their meds sorted and their routines intact. Folks with these conditions risk tougher times with COVID, so easy access to care is essential[26]. Quick online check-ups and tailored medication reviews let telepharmacy boost outcomes while sidestepping some old hurdles in getting help during crises. One study hints that this mix helps patients wrap their heads around both their prescriptions and bigger health matters, which can lead to steadier disease control and even a bit more joy[27]. Telepharmacy flipped the script on chronic illnesses, wedded to everyday tech to keep care rolling. A pie chart (Figure 5) illustrates the contributions of telepharmacy to chronic disease management during the COVID-19 era in India.

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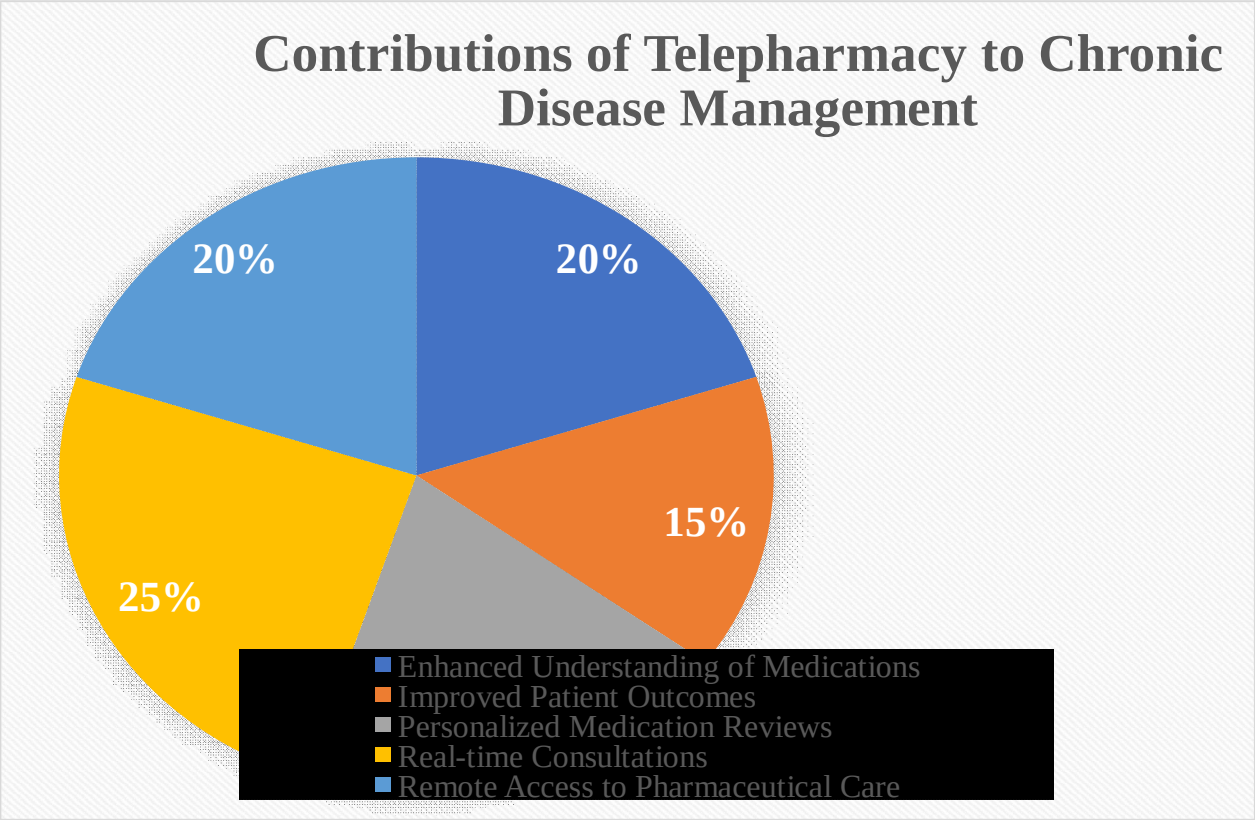


Figure 5: The contributions of telepharmacy to chronic disease management during the COVID-19 era in India. It shows the distribution of telepharmacy's roles: providing remote access to pharmaceutical care (20%), enabling real-time consultations (25%), offering personalized medication reviews (20%), improving patient outcomes (15%), and enhancing patients' understanding of their medications (20%). These elements highlight telepharmacy's transformative impact on healthcare delivery for chronic disease patients[27].

D. Patient education and counseling through telepharmacy

Telepharmacy stands as a lifeline for patient education and counseling, especially when resources are tight, like in India during COVID-19.

Pharmacists jump on digital platforms to hold online chats that help people handle their meds, spot worrisome side effects, and stick to their routines. This digital style wipes away distance barriers and weds modern tech with a down-to-earth touch so every patient gets advice that fits their own quirks. Research shows lots of folks trying digital counseling have bumped up their know-how in self-medication practices. Telepharmacy keeps advancing, now hooking up with broader health projects and nudging pharmacists to play big parts in community care (17). Taking on these fresh habits is key to boosting overall patient outcomes.

E. Case studies highlighting successful telepharmacy interventions

Telepharmacy burst onto the scene during the COVID-19 crisis as a cool way to deliver vital care while cutting back on in-person visits and avoiding jam-packed clinics. Some reports from different parts of India show these programs boost med access and lend a helping hand to folks in far-flung spots. A few projects mix remote check-ins with door-to-door med drop-offs, which helps patients stick to their treatment plans and eventually score better health outcomes. This approach shows that public health groups and private pharmacies can get wedded to tackle issues with access and fairness in healthcare. Evidence hints that telepharmacy's win depends a lot on the local socio-economic vibe—custom fixes might just do the trick. When these services lean on PersonCentered Care (PCC), they can really lift the quality of healthcare available to patients. The bar chart in Figure 6 displays the roles of telepharmacy interventions during the COVID-19 pandemic in India.

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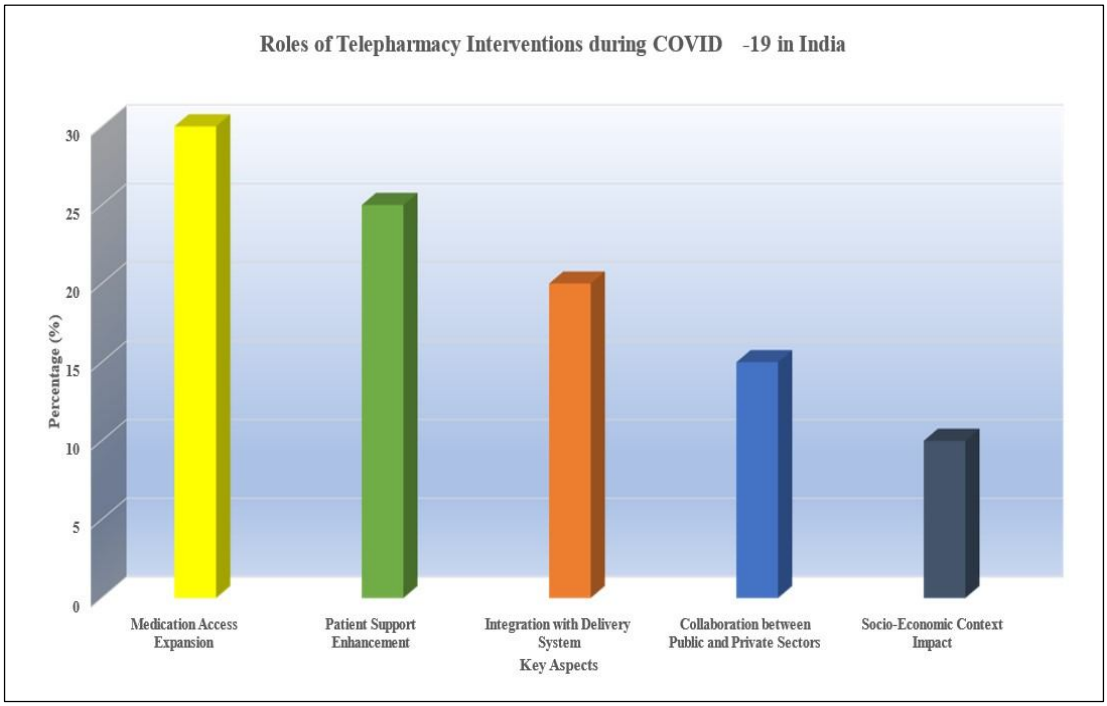


Figure 6: Roles of telepharmacy interventions during the COVID-19 pandemic in India. It highlights five key aspects: expanding medication access (30%), enhancing patient support (25%), integrating consultations with delivery systems (20%), fostering collaboration between public and private sectors (15%), and the impact of socio-economic context on intervention efficacy (10%). These elements underscore the transformative influence of telepharmacy on healthcare delivery[28].

IV. CHALLENGES FACED BY TELEPHARMACY IN INDIA

Telepharmacy in India is growing, but it hits some serious bumps that mess with how well it works and who can use it. The biggest issue is missing rules; providers end up guessing what to do because no clear guide is around. Privacy worries and data security problems play a big part here, and many setups still haven't got the necessary safeguards. Rural spots suffer too, thanks to flaky internet that stops folks from getting proper pharmaceutical advice. A lot of providers also haven't gotten the right training on telepharmacy practices, which doesn't help. Clearing these obstacles is a must if telepharmacy is going to show what it can do. Research[17] suggests that when these issues are sorted, healthcare access and quality can get a real boost. It might be a bit of a jumble now, but tackling these rough patches may finally free up telepharmacy's full potential. Table 4 shows some Challenges Faced by Telepharmacy in India.

Challenge	Description	Impact	Prevalence
Internet Connectivity	Unstable network connectivity in rural areas	Disrupts teleconsultations and service delivery	High
Digital Literacy	Lack of familiarity with digital health platforms	Reduces patient engagement and adoption	Moderate
Regulatory Framework	Evolving telemedicine guidelines and policies	Creates uncertainty in practice and implementation	Moderate
Data Security	Concerns about patient data privacy and cybersecurity	Affects trust and willingness to use telepharmacy services	High
Infrastructure	Limited access to necessary technology in remote areas	Hinders widespread adoption of telepharmacy	High

Table 4: Challenges Faced by Telepharmacy in India[29]

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A. Technological barriers and internet accessibility issues

India rolled out telepharmacy during COVID-19 and bumped into major tech glitches and patchy internet access, especially in places that lack enough resources. These issues break the vital bond that weds doctors to their patients and end up messing with the quality of pharmacy services. Telemedicine has shown promise in boosting healthcare delivery, yet dodgy internet and a flimsy digital setup keep causing trouble[19]. Big gaps in digital know-how add to telepharmacy's woes since these services rely on users being pretty savvy online. National plans must knock down these obstacles so everyone, especially those left out, gets fair healthcare. One diagram lays out the wild tangle of health info routes and shows just how deep this mess runs.

B. Regulatory and legal challenges in telepharmacy practice

Telepharmacy is growing fast in India during the COVID-19 surge, but legal glitches and tangled rules keep it from a smooth ride. Digital healthcare is leaping forward, and it needs rules that simply work—ones that handle licenses, keep meds safe, and protect patient data. Without clear policies, pharmacists and patients stumble into uncertainty and may miss out on crucial services. State rules often mix unevenly with national laws, muddling telepharmacy practices and making care hit-or-miss. Telepharmacy promises to brighten healthcare, as you catch in chats about patient satisfaction with telehealth services[19], yet a missing unified legal backbone really cuts its punch. Tech like healthcare communication networks gets wedded to the whole system only when a tough framework shows up to enforce the law and win trust.

C. Concerns regarding data privacy and security

Telepharmacy is booming in India during the COVID-19 mess. Data privacy and security worries keep cropping up as more patients lean on online pharmacy services. This shift sparks fears about just how safe their secret health details remain. Cyber hiccups and data leaks can wreck trust and mess up the way these services run. Studies show that lots of healthcare providers stumble because they rushed telehealth without getting the right training to guard patient data . Old privacy rules just don’t cut it anymore, leaving consumers in a risky spot. A close look at telepharmacy’s scene—as shown by the diagram of a healthcare communication network—makes it clear that if security isn’t beefed up, all the cool benefits of telepharmacy might just fall apart.

D. Resistance from traditional pharmacy practitioners

Traditional pharmacists still cling to old-school in-person methods during COVID-19, and telepharmacy just hasn't hooked them. They worry that online chats might kill that personal vibe crucial for looking after patients. People think meeting face-to-face is what really keeps meds in line and helps educate patients. Then there’s that nagging worry about keeping private info safe on digital platforms, which only deepens their doubt. This pushback screams out for plain training sessions and a straightforward way to talk about these changes, especially when health crises hit. Some studies in pharmacy classes and public health work hint that showing off telepharmacy’s perks might win over the hesitant. Giving these pharmacists a run-through in telehealth might just calm their nerves and pull them into the mix. In the end, teaming up to show how telepharmacy beefs up patient care might flip all that resistance into trust and shake up healthcare in India. Figure 7 depicts the poster for the 63rd National Pharmacy Week which is Focus on Pharmacy's Role in Health Education and Services.



Figure7. Poster for the 63rd National Pharmacy Week: Focus on Pharmacy's Role in Health Education and services [30]

E. Limitations in patient-pharmacist communication

Patient-pharmacist communication is key for treatment wins, but problems still pop up, especially with telepharmacy. Without face-to-face chats, pharmacists miss the shot to get wedded to real trust and the casual vibe needed for talking about meds. Studies [15] show that when pharmacists skip on hands-on help, many patients trip over confusing pill routines and unexpected side effects, causing them to ditch their treatment plans. Relying on digital screens can crank up these issues, especially for folks with sketchy tech access or who just aren't comfy with digital tools[16]. Privacy and security worries in online spaces add extra knots to the mix. All this tells us pharmacists need better training and extra resources so they can offer remote care the right way, letting telepharmacy do its thing.

V. FUTURE PROSPECTS OF TELEPHARMACY POST-COVID-19

COVID-19 sparked a fresh burst for telepharmacy in India. Healthcare systems jump on digital tools while telepharmacy is set to help folks get meds in places that have long been overlooked. AI, as mentioned in [18], might kick in to give care that fits patients like a glove and lead to better health outcomes. People are buzzing about easier healthcare, and honestly, many want things to be simpler. Mobile health tech—like that illustrated in — lets pharmacists get wedded to tasks like juggling medication plans and schooling patients from afar. Yet, grappling with cybersecurity glitches and winning patient trust still loom big. Basically, telepharmacy is morphing into a key piece of India's updated health scene. Table 5 showcases the Projected Growth of Telepharmacy in India.

Year	Market Size (USD Millions)	Annual Growth Rate (%)	Number of Telepharmacy Platforms
2023	120	15.5	50
2024	138	16.2	65
2025	162	17	85
2026	192	18.5	110
2027	230	19.8	140

Table 5: Projected Growth of Tele pharmacy in India[31]

A. Potential for integration into mainstream healthcare

Telepharmacy in India is quickly catching on as it makes getting meds easier and smooths out prescription handling. The COVID19 crisis threw open gaps in old-school healthcare, so telepharmacy jumped in to keep care going—especially for folks stuck in far-off spots. Health pros now harness modern tech that weds live chats with speedy med drops while they keep tabs on whether patients stick to their plans. Research on digital health tools shows they do a solid job with chronic conditions, which gives telepharmacy extra cred[18]. A quick peek at our health communication setup reveals that pharmacists, providers, and patients need to buddy up; sometimes, teaming up sparks better results and ramps up the overall hustle in our shifting care scene.

B. Innovations in telepharmacy technology

Telepharmacy is shaking up how we handle pharmaceutical care, especially during the COVID-19 crunch in India. Remote patient check-ins, digital scripts, and mobile health tools let pharmacists dish out meds and advice faster, lightening loads on old-school clinics. AI wedded with data crunching smooths out managing medications; it helps pharmacists spot risky drug clashes and whip up treatment plans that really fit. Research shows many pharmacists are ready to roll with telepharmacy, hinting at a shift to make these tech tweaks the norm. Studies in different spots tell us that telepharmacy fixes medication mix-ups even in far-off areas. Overall, these tech moves boost patient safety and stretch pharmacy services to more corners.

C. Policy recommendations for sustainable telepharmacy

Telepharmacy for the long haul needs smart policies that cover tech setups, smooth access, and hands-on training. Lawmakers must wed tele pharmacy with today's healthcare networks by giving providers solid tech help and real training—research shows practitioners are pretty on board with telehealth. Also, craft a system that keeps patient secrets safe and locks down data; this move builds public trust and ups service acceptance. Set up constant checks to see how telepharmacy performs and tweak things whenever trends or patient feedback call for it. With these moves, India can boost access to meds during crises like COVID-19 and lay the groundwork for long-term leaps in care. A diagram lays out the chances for pharmacists in the health mix, tying a bunch of ideas together in a simple sketch.

D. Role of telepharmacy in public health emergencies

Telepharmacy shines during big health crises like COVID-19. It is a simple fix to keep medicine care going and cut down the risks of meeting face-to-face. Remote consults let pharmacists handle drugs and drop important advice without being there in person. This setup really helps those who need extra care. The AKO app, for instance, weds smart tech with everyday treatment, boosting safer self-medication habits. It also reaches folks in far-off spots when traveling is such a pain. Digital health and telepharmacy mix things up, proving pharmacists anchor us in tough times. The field is changing fast; sometimes things are just plain and powerful.

E. Vision for a hybrid model of pharmacy services

Telepharmacy shook up the pharmacy scene during COVID-19, showing a major shift in how care gets delivered. It weds old face-to-face chats with fresh telehealth gadgets to handle meds in a snappy, patient-friendly way. Pharmacists rock digital gear so patients snag timely care and proper med handling no matter where they are. Some studies—even ones on quitting smoking— hint that mixing digital tricks with team learning really bumps up health outcomes. The switch to this mix-of-old-and-new style mirrors current trends; tech gives both providers and patients a shot at grabbing control of their health. In the end, this bold idea might kick pharmacy services up a notch and help public health bounce back in the post-COVID world.

VI. CONCLUSION

Telepharmacy kicked in during COVID-19 in India and flipped the healthcare scene by opening up access and smoothing out care even when things got rough. Health pros wedded digital tools with old-school pharmacy hacks, holding live chats, customizing meds, and even teaching patients in refreshingly new ways—all building a vibe that centers on the patient. Some recent studies hint that telemedicine's boost for pharmacy work has put telepharmacy in the spotlight as a smart move for steady care that cuts down the risks of face-to-face visits[32]. Telepharmacy's future rests on beating hurdles like messy rules and tech gaps. Embracing modern fixes like those seen in the healthcare communication network might let telepharmacy stretch care even further, steering India toward better health outcomes [33].

VII. SUMMARY OF KEY FINDINGS

Telepharmacy flipped the script in India during COVID-19, changing how care got delivered and boosting patient outcomes. Digital wizardry kept vital pharmacy services up and running while letting patients dive into remote chats and slick med management. Pharmacists and other health pros jumped on the telepharmacy ride to handle the lockdown chaos and distancing quirks. Studies (15) say patients really dug this setup, showing that quick access, dependability, and keeping things private matter a lot. As healthcare keeps shifting gears, mixing tech with telepharmacy backs big public health goals by keeping must-have services around even when times get tough, a nod to the pharma world's grit and nimbleness. Also, the Figure gives a clear peek at these link-ups, acting like a handy map for grasping the telepharmacy vibe.

A. Reiteration of telepharmacy's importance during COVID-19

COVID-19 lit up telepharmacy's role in India's healthcare. Lockdowns and social distancing wrecked regular pharmacy runs, so telepharmacy jumped in to keep care flowing. This shift not only opened up access to key meds but also changed how treatments get managed from afar. Some studies show that folks using digital pharmacy services get happier and more hands-on with their health, a sign that trust in online care is growing. Adding telepharmacy to the health mix isn't just a quick fix; it's a game-changer that weds old routines with new tech.

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These hints push us to build tougher telepharmacy setups to meet the rising need for fast patient care, as and show. A quirky diagram lays out how telepharmacy parts mix together, lighting up its important role in modern healthcare. In Figure 8 A Flowchart Analyses the Technology Integration in Healthcare Systems.

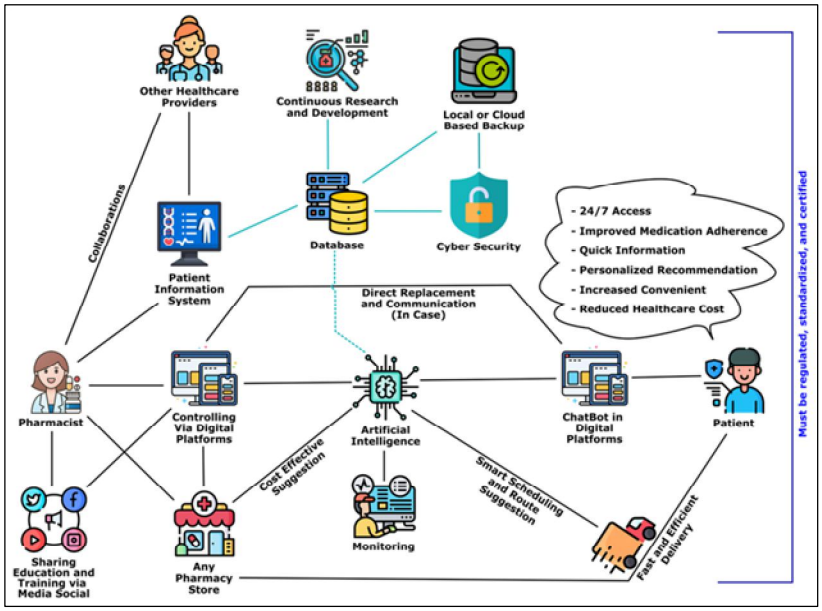


Figure 8. Technology Integration in Healthcare Systems: A Flowchart analysis[34]

B. Call to action for stakeholders in healthcare

Telepharmacy burst onto the scene and quickly became a game-changer. Government agencies, medical pros, and tech experts teamed up, building solid systems that wedded next-gen tech with everyday care. They poured resources into slick digital grids to keep chats safe and let patients snag their meds on time. This joint push doesn't just smooth out healthcare—it spreads help even in places where support is hard to find. Recent studies shout that boosting digital smarts unlocks telepharmacy's promise for both patients and providers (19). Tough rules and scarce funds hold it back; smashing these barriers is key to keeping the service in play [35]. In the end, all this joint hustle might really lift public health in India. Figure 9 shows roles of Pharmacists in Public and Population Health.

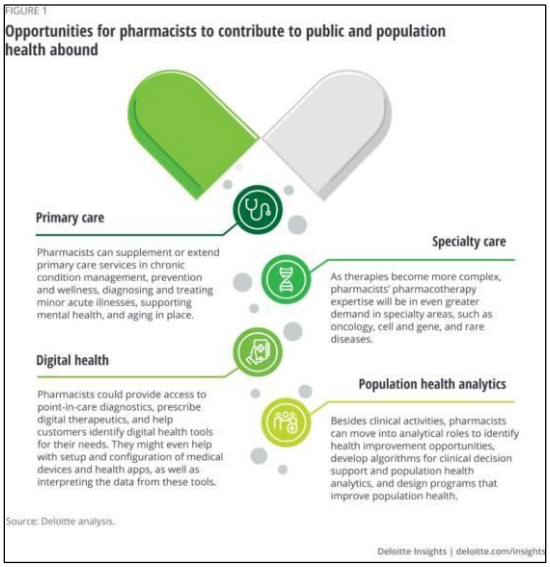


Figure 9. Roles of Pharmacists in Public and Population health[36]

C. Future research directions in telepharmacy

Telepharmacy is booming. New studies need to zero in on the big issues that help it shine—especially in India's healthcare system during the COVID-19 mess. People are urgently calling for research that digs into what patients and pharmacists go through. Using human factors methods like the SEIPS 2.0 approach might whip up some neat insights. It's crucial to see how telepharmacy is changing med routines, overall health, and money matters so that more cash flows into digital health ideas. Also, digging into how tech can boost communication and access in rural spots is key to shrinking healthcare gaps. Finally, tossing in visual tools, such as the strategic overview in, can lay out these links and nudge future plans toward a less clunky merge of telepharmacy into our health system.

D. Final thoughts on the evolution of pharmacy practice in India

COVID-19 gave India's pharmacy a big makeover. Telepharmacy exploded overnight and wedded digital tricks with everyday care, opening new doors for getting meds and patching up system gaps. Social distancing rules hit hard, forcing a rush into remote care as pharmacies leaped onto digital platforms to manage medications and share patient tips. Research shows telepharmacy tackled med hiccups head-on, helping patients get better results during those wild days. This change not only shows how nimble pharmacies can be but also hints that folks are warming up to online healthcare—studies[37] back that up. All in all, telepharmacy has flipped the game in India's health scene, promising lasting boosts in both access and care quality.

VIII. ACKNOWLEDGMENT

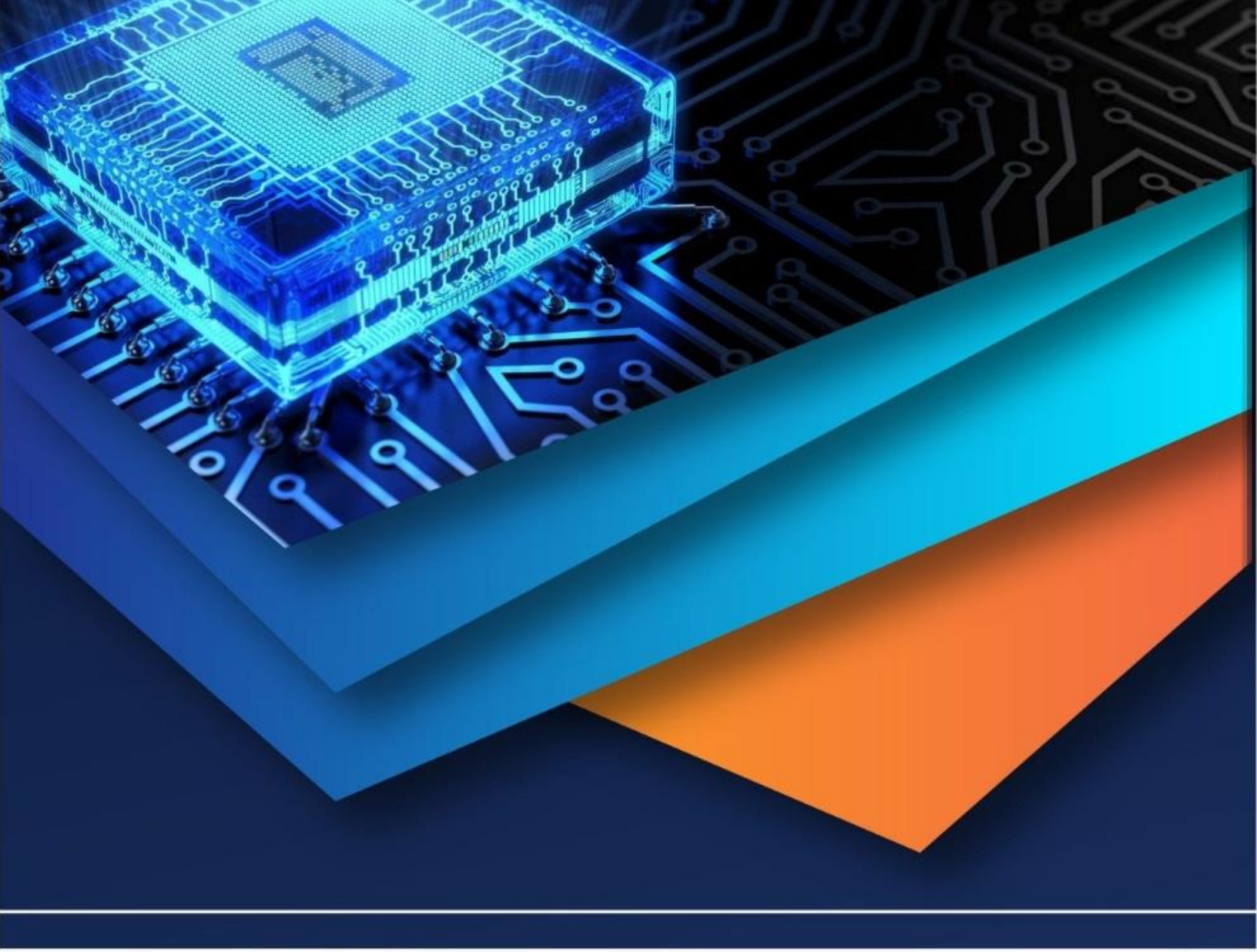
G.Sarkar would like to thank Department of Pharmaceutics, Global College of Pharmaceutical Technology, NH12, Palpara, Krishnagar, Nadia, West Bengal 741102 for all types of support and cooperation.Pritam Acharya, Kuheli Bhowmick, Nitai Chandra Adak, and Tapas Kumar Ghosh would like to thank Calcutta Institute of Technology,Uluberia ,Howrah,711316, for their cooperation. We also like to thank the Centre for Research in Nanoscience and Nanotechnology and the Department of Polymer Science and Technology, University of Calcutta, for providing all facilities.

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