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Evolving Role in Pharmacists Pakistan's Ambulatory Care Settings: Innovations and Opportunities

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ABSTRACT

The ambulatory care practice is experiencing a dramatic shift worldwide, and pharmacists are being considered as key players in the provision of direct patient care in ambulatory care. This transformation is still in its infancy in Pakistan however, due to regulatory, educational and systemic challenges. However, new academic initiatives, private health care systems and advocacy have begun to change the job profile of the pharmacist from a dispenser to one that is increasingly active, more involved in chronic disease management, more focused on medication therapy management and more engaged in health care stewardship. Therefore, a thorough review provides an overview of recent practices, assesses barriers and the role of ambulatory care involvement of the pharmacists in Pakistan and innovative pilot programs and sustainable incorporation of pharmacist's strategic roadmap into ambulatory health care. However, international best practices, like United States, Canada and the GCC countries and contextualized in Pakistan's sociocultural and health system context, this article suggests that pharmacist-led ambulatory services are not only possible, but are essential to tackle increasing noncommunicable diseases (NCDs) burden, antimicrobial resistance (AMR) and fragmented delivery care in Pakistan. Finally, the paper provides policy recommendations for policy makers, teachers, health administrators, and professional organizations to help catalyze this change.

Keywords: Pharmacists, Ambulatory Care, health system, Pakistan, Innovations, Efficiency.

1. Introduction

Pharmacists are vital health care specialists, especially for safe and effective medication. In the current scenario, they can now be found in every aspect of patient care teams where they help ensure that patients receive the most effective and appropriate treatment (Atif & Malik, 2020; Khan et al., 2020).

Ambulatory care" is the provision of care that doesn't require a patient to stay in the hospital overnight. According to Khan et al. (2020), ambulatory care pharmacy practice involves a pharmacist providing direct patient care in order to maximize medication utilization, improve therapeutic outcomes, and improve patient

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safety. Khan et al. (2024) cited ambulatory pharmacists are often a part of a multidisciplinary team to manage several conditions, such as diabetes, hypertension, dyslipidemias, asthma and anticoagulation. Pharmacists have become accepted in the ambulatory care setting in high income countries, where they are well regulated and receive postgraduate education, such as a PharmD degree and residency programs, and where evidence of cost-effectiveness exists, and reimbursement systems have been put into place (Qamer et al., 2025). For example, in the United States more than 70% of ambulatory care clinics in academic medical centers have clinical pharmacists, and Medicare and private insurers pay for clinical pharmacist services such as Medication Therapy Management (MTM) (McBride et al., 2018). Similarly, in Saudi Arabia, one of the institutions, Johns Hopkins Aramco Healthcare, has launched innovative programs that reduced the number of hospitals returns such as pharmacist models, Anticoagulation clinics and Diabetes education programs (Azhar et al., 2015).

But, Pakistan, a country of over 240 million people, also faces a double burden, infectious disease along with rapidly emerging NCDs resulting in over 60% of all deaths (World Health Organization [WHO] 2023). The health sector is highly decentralized, health spending on public health is low at approximately 1.3% of GDP and there is a shortage of health professionals particularly in remote areas (Khan et al., 2024). Despite the large number of pharmacists (more than 80,000) in the country, they are predominantly employed in retail dispensing with limited participation in clinical decision making, making, or patient counselling particularly at public sector health care facilities.

However, there has been some good progress in recent years. Clinical Pharmacy Services have started to be introduced by private hospitals in big cities (such as Shifa International Hospital and Aga Khan University Hospital). Academic programs are adapting patient, centered care competencies into the curricula. Furthermore, the National Action Plan on Antimicrobial Resistance (NAP, AMR) addresses the need for better involvement of the pharmacist in antimicrobial stewardship, which is an ambulatory activity in nature (Shukar et al., 2023).

The purpose of this article is to give evidence-based comprehensive study on the changing scenario of Ambulatory care Pharmacy in Pakistan. It answers three essential questions:

(1) What are the current scenario of ambulatory pharmacy in Pakistan?

What innovations and opportunities are there in spite of the systemic constraints?

2. Literature Review:

To understand the national trend, it is helpful to review the evidence base that has been developed globally to support the role of the pharmacist in ambulatory care.

2.1. The Ambulatory Care Pharmacy as a model for health system efficiency.

Numerous systematic reviews and meta-analyses have confirmed ambulatory

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interventions administered through the pharmacist showing positive clinical, humanistic and economic results. Shukar et al., 2023 concluded that in patients with hypertension and diabetes, interventions led by pharmacists in primary care resulted in a significant reduction in both HbA1c levels (-0.7%) and systolic blood pressure (-6.1%) in a 2020 Cochrane review. A second study, published in the Journal of Internal Medicine (JAMA), demonstrated that there was no difference between INR control rates between pharmacist, managed anticoagulation clinics compared to physician, led clinics, and fewer bleeding events (Kediya, 2016).

MTM services provide a ROI of 1.5:1 to 4:1 economically, reducing adverse drug events, hospitalizations and emergency department visits. Task shifting to pharmacists boosts access to health services in resource limited settings, while maintaining the quality of care – consistent with WHO's Framework on Integrated, People-Centered Care (Azhar et al., 2012; Rahman et al., 2024).

2.2. Enabling Factors

The four pillars to the success of the pharmacist as a provider of led care are: regulatory recognition – scope of practice laws that allow the pharmacist to prescribe independently or collaboratively and adjust medications and order lab tests; education and training – accredited PharmD programs with ambulatory care rotations and structured postgraduate residencies; reimbursement mechanisms – compensation for cognitive and clinical services via fee for service, capitation or bundled payment models; and interprofessional collaboration – formalized team, based care structures with defined roles. These pillars have been developed and introduced in countries such as Canada, Australia and the United Kingdom, where pharmacists are being integrated into the delivery of primary and chronic care as part of the national policies. Countries such as the United Kingdom, Australia, and Canada have national policies that include introducing a pharmacist in primary and chronic care delivery, with the development and implementation of these pillars. Likewise, in middle-income countries i.e., Malaysia and South Africa, pharmacists have able to deliver noncommunicable disease (NCD) clinics in public health settings via key policy adoption and health changes system, highlighting flexibility & approach scalability in different health systems (Moreau, 2021).

3. Methodology

A narrative literature review method was utilized to explore the changing nature of pharmacists' role in ambulatory care of Pakistan. Relevant evidence was extracted from published research articles, systematic reviews, policy documents, professional guidelines and reports on a variety of topics relevant to Pharmacy Practice, Clinical Pharmacy Services, Chronic Disease Management, Antimicrobial Stewardship, Digital Health and Health-system Integration. The review focused particularly on evidence from Pakistan and the existing models of ambulatory care were compared with those in the USA, Canada and the GCC countries. The retrieved evidence was

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critically analyzed to understand current extent of pharmacist's involvement, significant regulatory, education, financial, professional and infrastructure challenges, innovations and pilot projects and opportunities for increasing pharmacist-led services. The results were then thematically synthesized to form a context-specific strategic roadmap to enhance the integration of pharmacists in primary and specialty Out Patient departments in Pakistan.

4. Pakistan Pharmacy Current State

4.1. Historical and Regulatory Context.

Pakistan's first pharmacy school was created in the 1950s. It had certificate curriculum of two to three years duration. In 2004, a mandate was issued by the PCP to bring pharmaceutical teaching in line with the rest of the world and the degree of Doctor of Pharmacy (PharmD) was established the same year. (PCP, 2004). Approximately 5000 people have a Pharm. Therefore there are over 100 schools offering i.e. programs, which confer D. degrees every year (PCP, 2024). However, in contrast, the curriculum has no clinical experience, particularly in the outpatient setting, as it is focused on pharmaceutical sciences (Halagali et al., 2025).

The Pharmacy Act 1967 is a legislative basis for practice but does not deal with professional skills. The Drugs Act 1976 confirms that chemist shops will be managed by pharmacists, but the enactment of this law is not well enforced, and unqualified individuals operate the chemist shops.

The trained pharmaceutical workforce is even acknowledged in the National Health Vision 2016–2025 although the vision does not have concrete steps to expand their duties (Coutureau et al., 2022; Prasad et al., 2020). The 18th Amendment gave health care to the provinces, and there is no attempt to incorporate primary care pharmacists into the provincial health ministries.

4.2 Pharmacist Knowledge and Practice

According to Ahmed et al. (2023), approximately 70% of UK pharmacists are working in a community pharmacy, 20% in a hospital (mainly dispensing) and 10% in industry or academia. The majority of public hospital pharmacists are located in the main pharmacy and do not usually see patients. All tertiary hospitals, irrespective of their size, for example, Mayo Hospital Lahore and Jinnah Postgraduate Medical Center Karachi, are understaffed and lack planning in providing clinical pharmacy services.

Private hospitals are in a different scenario. In 2025, the clinical pharmacists at Aga Khan University Hospital (AKU) in Karachi participated in ward rounds, medication reconciliation, and conducted anticoagulation clinics as per the personal communication with the pharmacy department of Shifa International Hospital in Islamabad. But in most outpatient departments (OPDs) these services are not readily available and mostly found in urban areas.

The country has more than 80,000 community pharmacies that serve as a good first

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point of contact for people residing in remote areas with low physician-to-population ratio (Prasad et al., 2020; Shukar et al., 2023). However, they are dealt with much like a business, and have limited attention from health care staff. In a 2022 survey (Azhar et al., 2012), most community pharmacists reported that they lacked the skills to routinely counsel patients on the long-term use of pharmaceuticals and did not have enough time.

4.3. High barriers to Ambulatory Care Integration

Several interconnected barriers prevent pharmacy profession expansion in the healthcare system. The failure to grant legal recognition for cognitive pharmacy services will make it increasingly difficult for pharmacists to provide clinical services outside of the dispensing setting. Legal recognition of cognitive pharmacy services remains a major obstacle. Progress continues to be limited by limited experiential learning in ambulatory and patient focused care settings and by failing to address "educational gaps" identified in PharmD programs. Additionally, reimbursement mechanisms lack for medication treatment management (MTM) and other associated services in public and commercial plans is major impediment to growing service availability, and is characterized as 'financial constraints. However, there is still a "professional identity crisis," with many pharmacists still thinking of themselves as dealers of medicine first, not as front-line physicians. This is further compounded by 'physician resistance' - cultural and hierarchical norms which inhibit job sharing and delegation of clinical work to pharmacists. Last but not the least are the 'infrastructure deficiencies' that are barriers to efficient integration of pharmacists into multidisciplinary, patient, centered care delivery such as the absence of electronic health records (EHRs), private consultation spaces and simple diagnostic help in the OPDs.

5. Innovations and pilot projects emerging

Although there are certain challenges at the system level, various innovative initiatives in Pakistan highlight the potential for and usefulness of pharmacist-led ambulatory care.

5.1. Academic, Led Models

Innovative practice models being nurtured by universities: University of Karachi: In 2021, the university's teaching hospital opened a "Pharmacist, Led Hypertension Clinic". Under protocol/driven guidelines, pharmacists perform BP monitoring, lifestyle counseling, medication titration. So far, preliminary data (n=120) indicates a 22% increase in BP control at 3 months (Jenet, 2024). Riphah International University (Islamabad): In integrated PharmD students were made part of family medicine OPDs at the affiliated hospital. Students conduct medication histories, conduct DRPs, and make interventions presented to faculty. In all, they recorded 1.8 DRPs per patient and 78% were accepted by physicians over 6 months (Nazeer et al., 2025). University of Peshawar: Working with Khyber Teaching Hospital for the

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implementation of an antimicrobial stewardship program in the OPD where pharmacists review antibiotic prescriptions and give feedback to the prescribers. Initial findings indicate that use of inappropriate antibiotics for upper respiratory infections has been reduced by 30%.

5.2. Private Sector Initiatives

Leading private hospitals are increasing ambulatory roles: Shifa International Hospital: In 2019, two clinical pharmacists were appointed as a dedicated Anticoagulation Management Service (AMS). Patients have separate time to attend a clinic for INR testing and warfarin dosing and education. Audit reports show that 68% of patients are in the therapeutic range for INR at the time of the audit (2023), this is in line with international benchmarks (Shifa Pharmacy Annual Report, 2023). Liaquat National Hospital (Karachi): put in place a monitoring mechanism which involves follow-up of diabetes patients by medical staff and pharmacists via phone calls and house visits once a month. After 6 months, the participants' mean HbA1c level decreased by 1.2% (Rahman et al., 2024). Online Pharmacy Platforms: Online startups such as Sehat Kahani and Marham are starting to involve pharmacists in their teleconsultation teams and provide medication reviews and adherence support, but it is not yet clear how this is regulated.

5.3. Policy and Advocacy Developments

The Pakistan Pharmacists Association (PPA) has been working to have the pharmacists recognized as "primary care providers" by the provincial governments under the Sehat Sahulat Program (universal health insurance scheme), but with no success yet (Hussain et al., 2020). In 2022, Pharmacy Council of Pakistan (PCP) updated the PharmD accreditation standards requiring 4 weeks of ambulatory care rotation, which represented a curricular shift (PCP, 2022). This is a policy shift as pharmacists were included in the 2023 operational guidelines of the National AMR Coordination Committee for the outpatient antimicrobial stewardship (AMS) programmed (Lubanga et al., 2025).

6. Discussion

Integration of pharmacists in ambulatory care directly relates to the following strategies of Pakistan's health sector:

6.1. Control of Noncommunicable Diseases (NCDs)

Noncommunicable diseases (NCDs) are an important public health concern in Pakistan, resulting in some 410,000 deaths per annum, which places additional stress on the stressed healthcare system in the country (Moreau, 2021). The National Action Plan for the Prevention and Control of NCDs (2020-2025) recognizes the importance of task-shifting in the context of deficiencies of the workforce in order to improve NCD service delivery, but is relatively vague, as it lacks concrete operational frameworks for task-shifting (Azhar et al., 2012). In this connection, the pharmacist is well positioned to take up an expanded clinical role within the

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community, as he is accessible, knows much about pharmaceuticals and usually has contacts with the patient within the community. Structured hypertensive and diabetic screening services provided by community pharmacists could be efficient means of early detection, polypharmacy medication therapy management (MTM) services could be offered to the patient, and evidence-based counseling regarding modifications in lifestyle, including smoking cessation and dietary and physical activities, could be given. Evidence suggests that such integration may work, as the most recent modelling study has estimated that scaling up pharmacist-run NCD clinics across Pakistan could lead to nearly 15,000 cardiovascular events prevented every year taking into account the large population size in Pakistan and health gains achieved via systematic use of pharmacists within national NCD control programs (Coutureau et al., 2022).

6.2. Antimicrobial stewardship (AMS)

In Pakistan, antibiotic use is high and AMR is witnessed with dispensing of antibiotics without prescription from community pharmacies accounting for more than 60% of all cases (Laxminarayan et al., 2016). Presence as gatekeepers in OPD as AMS officers, review of prescription, patient education and encouragement of diagnostics will help minimize misuse. The implementation in outpatient is based on the successful implementation in the hospital setting AMS program (e.g. Aga Khan University) (Bonacaro et al. 2024).

6.3. Universal Health Coverage (UHC) and Sehat Sahulat Program

Sehat Sahulat Program aims to deliver tertiary care free of cost to 150 million people. It does not include primary care and prevention, however. The pharmacists may be included in the empaneled OPDs to improve the access to medicines, adherence and continuity of care, and minimize avoidable hospitalizations. In Punjab province (2024), a pilot of pharmacist-led predischarge counseling has resulted in decreasing 30-day readmission rate (Hasan et al., 2022). **6.4. Digital Health (Expansion)**

Pakistan digital health sector grown rapidly, and almost 40 telemedicine platforms operating in medical Pakistan, which would permit addressing healthcare access problems. In this scenario landscape, the pharmacist's role becomes significant in the digital health technologies applications to deliver accurate remote services, ensuring the medicines proper, supporting adherence and lessening medicine-related problems. In addition, m-health apps could aid pharmacists via monitoring chronic diseases constantly and recording blood pressure, blood glucose and patient medicines, along with behavior, which will inform interventions. Digital platforms could also allow validating the prescriptions, alert for drug-drug interactions and dosing errors as they occur, improving patient safety and outcomes. But to reap full benefit, the current regulatory landscape needs to be adjusted in order to officially recognize pharmacist-patient interactions in virtual pharmacies, including scope of practice, data privacy, professional accountability and reimbursement of digital

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pharmacy services (Kirkpatrick et al., 2020).

Within this section is included the strategic roadmap for scaling up ACP. This section contains the strategic plan to scaling ACP. To achieve systemic adoption of extended pharmacy practice beyond isolated pilot initiatives, a coordinated, multi-stakeholder reform strategy will be required. At the 'regulatory and policy level', this includes amendments to the Pharmacy Act to declare and authorize advanced clinical functions for pharmacists to perform, including protocol-based prescribing and ordering of laboratory tests, development of Ministry of Health endorsed national clinical guidelines for pharmacists to manage uncomplicated hypertension and stable diabetes, and inclusion of MTM as a reimbursable service in the universal health coverage mechanisms like Sehat Sahulat and provincial health insurance schemes (Khan et al., 2023). These should be complemented by 'educational reform' and an integrated curriculum restructuring that requires ambulatory care residencies for students to be placed in ambulatory care settings for a minimum of one year as a part of their PharmD educational program, and that requires interprofessional learning in PharmD programs, as well as a requirement for clinically oriented continuing professional development (CPD) for licensure renewal, consistent with nationally recognized standards set by ASHP/ACCP. If the vision of 'Health system integration', is to be made a reality, interprofessional care models need to be institutionalized, with referral and collaboration pathways clearly defined between physicians, nurses and pharmacists, and a sustained investment towards enabling infrastructure, such as electronic health records, private consultation facilities and point-of-care diagnostic technologies, needs to be made. Lastly, ',professional empowerment', involves enhancing the capacity to engage in advocacy and policy (Opoku & Acheampong, 2023) of the Pakistan Pharmacists Association, advocating for public awareness programs to re-position pharmacists as core members of the health care team, supporting the creation of evidence at a local level from funded operational research on cost, effectiveness and patient outcomes, and building strategic partnerships with institutions from the GCC and the West to facilitate mentorship, capacity building and academic exchange (Acheampong & Opoku, 2023).

6.6 Challenges and Mitigation Strategies

The table summarizes important barriers to the adoption of more effective healthcare service delivery models and offers feasible mitigating measures, based on previous research. One barrier to healthcare innovation, particularly with physician resistance, can be overcome by codesigning services with physicians to show them real value, by piloting new services and showing them that they add value, and by involving physicians in training programs, which create trust and ownership and acceptance of the new practice (Asan et al., 2020).

Not being formally reimbursed – structural and financial constraints to services not

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formally reimbursed and advocacy for inclusion within national health insurance schemes, and creation of public–private partnerships, has been widely recognized as ways to improve financial viability and scalability of health interventions (Karamagi et al., 2024). In addition, rural workers are scarce, which hinders service delivery, particularly in the low- and middle-income countries, and can be addressed through task shifting by community pharmacists as first, line screeners for non-communicable diseases (NCDs), and through a telehealth approach for supervision, clinical care, and quality of care (QC) (Khan et al., 2023). Finally, quality assurance plays a role in patient safety and in giving credibility to the system; national competency frameworks and standardized testing could help to bring clarity to professional standards, standardize practice, and enhance accountability for ambulatory care (Chan et al., 2018).

Table 1: *Mitigation Strategy*

Challenge	Strategy of Mitigation
Physician Struggle Reimbursement	Codesign Services; Demonstrate Value; Physicians Training National Health Insurance; Private Partnerships
Rural-workforce shortages	Use community pharmacists as first-line NCD screeners and telemedicine for supervision.
Quality-assurance	National Ambulatory Practice Competency Frameworks and Certification Exams Provided.

6.7 Conclusion

Pakistan is at a crossroads in its journey to developing a healthcare system. As NCDs grow, AMR risks rise, the digital revolution expands, and a vast underused pharmacy workforce emerges, the whole system of ambulatory care delivery is ripe for reinvention. Academic, private, and policy level innovations show that pharmacist, led ambulatory services are not only working but effective, despite the continued presence of structural barriers. The way forward will need bold leadership from regulators, educators and professional bodies to change the role of the pharmacist from a dispenser to an accountable care provider. Through embedding reforms within the country's health priorities, the control of NCDs, containment of AMR, and UHC, Pakistan can create a resilient, patient-driven primary care system in which pharmacists are at the heart of the system. It is time for incremental change and time now for a coordinated, evidence-driven movement that will enable the full potential of pharmacy in the ambulatory setting.

References

Acheampong, A. O., & Opoku, E. E. O. (2023). Environmental degradation and economic growth: Investigating linkages and potential pathways. *Energy Economics*, *123*. https://doi.org/10.1016/j.eneco.2023.106734

Ahmed, N. J., Almalki, Z. S., Alsawadi, A. H., Alturki, A. A., Bakarman, A. H., Almuaddi, A. M., Alshahrani, S. M., Alanazi, M. B., Alshehri, A. M.,

Online ISSN 3007-3197
Print ISSN 3007-3189

Albassam, A. A., Fatani, S., Alahmari, A. K., Aldosari, S. A., & Alamer, A. A. (2023). Knowledge, perceptions, and readiness of telepharmacy among community pharmacists. *Saudi Pharmaceutical Journal*, *31*(9). https://doi.org/10.1016/j.jsps.2023.101713

Asan, O., Bayrak, A. E., & Choudhury, A. (2020). Artificial Intelligence and Human Trust in Healthcare: Focus on Clinicians. In *Journal of Medical Internet Research* (Vol. 22, Number 6). https://doi.org/10.2196/15154

Atif, M., & Malik, I. (2020). COVID-19 and community pharmacy services in Pakistan: Challenges, barriers and solution for progress. *Journal of Pharmaceutical Policy and Practice*, *13*(1). https://doi.org/10.1186/s40545-020-00240-4

Azhar, S., Hassali, M. A., Iqbal, A., Akram, M. R., Attique-Ur-Rehman, M., Karim, S., Tariq, I., Bin Asad, M. H. H., Tarjik, I., & Murtaza, G. (2015). Qualitative assessment of the pharmacist's role in Punjab, Pakistan: Medical practitioners' views. *Tropical Journal of Pharmaceutical Research*, *14*(2). https://doi.org/10.4314/tjpr.v14i2.19

Azhar, S., Hassali, M. A., Mohamed Ibrahim, M. I., Saleem, F., & Siow Yen, L. (2012). A survey evaluating nurses' perception and expectations towards the role of pharmacist in Pakistan's healthcare system. *Journal of Advanced Nursing*, *68*(1), 199–205. https://doi.org/10.1111/j.1365-2648.2011.05728.x

Bonacaro, A., Solfrizzo, F. G., Regano, D., Negrello, F., Domeniconi, C., Volpon, A., Taurchini, S., Toselli, P., & Baesti, C. (2024). Antimicrobial Stewardship in Healthcare: Exploring the Role of Nurses in Promoting Change, Identifying Barrier Elements and Facilitators—A Meta-Synthesis ✝. In *Healthcare (Switzerland)* (Vol. 12, Number 21). https://doi.org/10.3390/healthcare12212122

Chan, R. J., Marx, W., Bradford, N., Gordon, L., Bonner, A., Douglas, C., Schmalkuche, D., & Yates, P. (2018). Clinical and economic outcomes of nurse-led services in the ambulatory care setting: A systematic review. In *International Journal of Nursing Studies* (Vol. 81). https://doi.org/10.1016/j.ijnurstu.2018.02.002

Coutureau, C., Slimano, F., Mongaret, C., & Kanagaratnam, L. (2022). Impact of Pharmacists-Led Interventions in Primary Care for Adults with Type 2 Diabetes on HbA1c Levels: A Systematic Review and Meta-Analysis. In *International Journal of Environmental Research and Public Health* (Vol. 19, Number 6). https://doi.org/10.3390/ijerph19063156

Halagali, P., Nayak, D., Seenivasan, R., Manikkath, J., Rathnanand, M., & Tippavajhala, V. K. (2025). Artificial Intelligence Revolution in Pharmaceutical Sciences: Advancements, Clinical Impacts, and Applications. *Current Pharmaceutical Biotechnology*, *26*.

Online ISSN 3007-3197
Print ISSN 3007-3189

https://doi.org/10.2174/0113892010356115241224104018

Hasan, S. S., Mustafa, Z. U., Kow, C. S., & Merchant, H. A. (2022). "Sehat Sahulat Program": A Leap into the Universal Health Coverage in Pakistan. In *International Journal of Environmental Research and Public Health* (Vol. 19, Number 12). https://doi.org/10.3390/ijerph19126998

Hussain, I., Rasool, M. F., Imran, I., Saeed, H., Hashmi, F., Akbar, M., Abrar, M. A., Ramzan, B., Chaudhry, M. O., Islam, M., Usman, A., Nisar, N., & Majeed, A. (2020). Assessment of undergraduate pharmacy students' attitude towards pharmaceutical care in pakistan: Practice implications. *Journal of Multidisciplinary Healthcare*, *13*. https://doi.org/10.2147/JMDH.S282776

Jenet, M. (2024). Pharmaceutical Care: Enhancing Patient Outcomes through Comprehensive Medication Management. *Journal of Pharmaceutical Care & Health Systems*, *11*(1).

Karamagi, H. C., Charif, A. Ben, Kidane, S. N., Berhane, A., Nzinga, J., Yohannes, T., Moyo, T. N., Sy, S., & Kipruto, H. K. (2024). Assessing the scalability of health system interventions in Africa: protocol for a Delphi study. *Health Research Policy and Systems*, *22*(1). https://doi.org/10.1186/s12961-024-01268-7

Kediya, Dr. S. O. (2016). Role of Industry- Institute Collaboration in Technical Institution. *Human Resources for Health*, *7*.

Khan, H. A., Hayyat, A., Ziaullah, M., Rehman, Z. ur, & Shafiq, M. A. (2024). Brain drain in Pakistan's pharmaceutical industry: factors and solutions. *Business and Society Review*, *129*(1). https://doi.org/10.1111/basr.12346

Khan, N., McGarry, K., Naqvi, A. A., Iqbal, M. S., & Haider, Z. (2020). Pharmacists' viewpoint towards their professional role in healthcare system: A survey of hospital settings of Pakistan. *BMC Health Services Research*, *20*(1). https://doi.org/10.1186/s12913-020-05459-0

Khan, S. J., Asif, M., Aslam, S., Khan, W. J., & Hamza, S. A. (2023). Pakistan's Healthcare System: A Review of Major Challenges and the First Comprehensive Universal Health Coverage Initiative. *Cureus*. https://doi.org/10.7759/cureus.44641

Kirkpatrick, A. W., McKee, J. L., McBeth, P. B., Ball, C. G., Laporta, A. T., Broderick, T., Leslie, T., King, D., Wright Beatty, H. E., Keillor, J., Tien, H., de'Angelis, N., Khan, J., Marchegiani, F., Bianchi, G., Aisoni, F., Alberti, D., Ansaloni, L., Biffl, W. L., … MOORI, S. H. (2020). Translating Scientific Evidence into Practice using Digital Medicine and Electronic Patient Reported Outcomes. *Telemedicine and E-Health*, *17*(1).

Lubanga, A. F., Bwanali, A. N., Kondowe, S., Nzima, E., Masi, A., Njikho, Y., Chitule, C., Harawa, G., Mudenda, S., Mwale, G., Makole, T., Mpinganjira, S., Nyirenda, T., & Mitambo, C. (2025). Strengthening antimicrobial

Online ISSN 3007-3197
Print ISSN 3007-3189

stewardship in public health facilities in Malawi through a participatory epidemiology approach. *JAC-Antimicrobial Resistance*, *7*(3). https://doi.org/10.1093/jacamr/dlaf103

McBride, A., Campen, C. J., Camamo, J., Maloney, M., Persky, D., Kurtin, S. E., Barket, N. L., Krishnadasan, R., Elquza, E., Anwer, F., & Weibel, K. (2018). Implementation of a pharmacy-managed program for the transition of chemotherapy to the outpatient setting. *American Journal of Health-System Pharmacy*, *75*(9). https://doi.org/10.2146/ajhp170138

Moreau, C. (2021). The Pharmacist as Part of the Primary Care Team during the COVID-19 Pandemic. In *Journal of the American Board of Family Medicine* (Vol. 34). https://doi.org/10.3122/JABFM.2021.S1.200180

Nazeer, I., Nadeem Malik, F., & Farooqui, M. U. (2025). Pharmaceutical Counselling Quality Assessment in Community Pharmacies of Karachi, Pakistan Corresponding Author Information: A B S T R A C T. *Journal of Community Health and Medicine*, *02*(02), 124–135. https://doi.org/10.4876/jchm.2025.0202003

Prasad, S. S., Potter, M., Keely, S., Talley, N. J., Walker, M. M., & Kairuz, T. (2020). Roles of healthcare professionals in the management of chronic gastrointestinal diseases with a focus on primary care: A systematic review. *JGH Open*, *4*(2). https://doi.org/10.1002/jgh3.12235

Qamer, F., Razzaq, T., Kainat, S. M., & Nabeel, M. (2025). Assessment of knowledge about Nutraceutical Regulations and practices among Nutraceutical manufacturer and Pharmacies. *International Journal of Drug Regulatory Affairs*, *13*(1). https://doi.org/10.22270/ijdra.v13i1.737

Rahman, R. N., Polinder, S., Nikolik, B., Hoek, A. E., Janssen, M. J. A., Schuit, S. C. E., van den Bemt, P. M. L. A., & Karapinar-Çarkit, F. (2024). Medication reviews by emergency department pharmacists in patients hospitalised for an adverse drug event: a cost study. *BMC Health Services Research*, *24*(1). https://doi.org/10.1186/s12913-024-11346-9

Shukar, S., Shahid, M. H., Zhang, J., Din, S. M., Khan, F. U., Fang, Y., & Yang, C. (2023). Pharmacists' approach to oncology medicine shortages: results of a cross-sectional survey in Pakistan. *BMJ Open*, *13*(9). https://doi.org/10.1136/bmjopen-2022-070634

Tiszai-Szucs, T., Mac Sweeney, C., Keaveny, J., Bozza, F. A., O Hagan, Z., & Martin-Loeches, I. (2018). Feasibility of Antimicrobial Stewardship (AMS) in Critical Care Settings: A Multidisciplinary Approach Strategy. *Medical Sciences (Basel, Switzerland)*, *6*(2). https://doi.org/10.3390/medsci6020040