



Review Article

The Role of Pharmacy and Pharmacology in Hospital Management and Healthcare Administration: A Mini Review

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Abstract:

Background: Pharmacy and pharmacology are integral to modern healthcare systems, influencing clinical outcomes, patient safety, medicines management, and institutional efficiency. Their roles extend beyond traditional functions, contributing significantly to hospital administration, policy development, and rational pharmacotherapy. Despite this evolving scope, the strategic importance of these disciplines in healthcare management remains underemphasized, particularly in developing health systems.

Methods: This mini-review is based on secondary data obtained from peer-reviewed literature accessed through databases including PubMed, ScienceDirect, Google Scholar, ResearchGate, and HINARI. Relevant studies addressing pharmacy practice, pharmacology, healthcare administration, and interprofessional collaboration were critically evaluated.

Key Findings: Evidence indicates that pharmacy practice has transitioned from a product-centered model to a patient-oriented clinical role involving medicines management, pharmacovigilance, patient counseling, and medication therapy management. Pharmacology contributes through drug development, rational therapeutics, safety evaluation, and mechanistic insights that inform clinical decision-making. Both disciplines play essential roles in optimizing healthcare delivery, resource utilization, and patient safety frameworks.

Conclusion: The participation of pharmacy and pharmacology plays a critical role in strengthening healthcare systems through improved medicines management, patient safety, and rational pharmacotherapy.

Keywords: Pharmacy, Pharmacology, Healthcare Administration, Hospital Management, Patient Safety

Introduction

Hospital management and administration are pivotal components of healthcare that helps to coordinate an integration of medical professionalism, essential healthcare supplies and definitive attention [1]. This improves the quality of life of patients by effective cooperation by various department of the medical care system [2]. The placement and utilization of resources at its size in an

organization, including hospitals, it is necessary to consider resource sustainability as a strategic approach to improving performance as one of these resources is a drug store such as a pharmacy that requires technological support in managing it [3]. Though pharmacies responsibilities is high due to the demand for drugs support, how to provide a number of these drugs to the right patient with proper precision of beneficence [4]. This could be jeopardized due to high healthcare demand especially in public medical facilities. The appropriateness of efficiency of pharmacy and other medical professional become effective with involvement of a precise knowledge of pharmacology [5].

Pharmacy service is an essential part of a healthcare system as the profession is well recognized, placed and practiced to its full potentials in developed countries. It has improved from a product focused practice to a patient-oriented care [6]. They have a primary duty of providing drug information, medicines management, preparation and dispensing of medicines, counseling of patients, and formulating pharmaceutical care plan for patients. Pharmaceutical care plan is an individualized service provided to improve the quality of patient's health. Collaborative relationship between the pharmacist and the physician to improve the health status of patients is visible through shared pharmacological knowledge. Pharmacologist involvement in clinical drug discovery and development in emerging disease management helps to synergize administrative roles of pharmacist in traditional roles of pill counting, packaging, and dispensing [7]. The condition is different in developing countries as the method of pharmaceutical care is derailed due to less access to patients' records, time constraints, lack of standard reimbursement, poor communication among healthcare professionals, insufficient number of qualified pharmacists, trained pharmacologists and absence of policies adherence and involvement [8].

There is a need to enhance collaborative relationship between pharmacist and pharmacologist to solve medication problems and health related problems as it will foster standardized quality of medication for precise treatment [9]. Treatment progression is recognized with an effective documentation system. This study helps to define the role of pharmacology and pharmacy in building effective healthcare delivery system through fascinating patient oriented clinical care. This could be actualized by healthcare practice to ensure maximally that there is a clinical setting work force synergism among health workers by pharmacological knowledge and standards [10].

Materials and Methods

This mini-review was conducted using secondary data derived from peer-reviewed literature. Over 100 articles were screened over a six-week period, of which 60 relevant studies were selected based on scope, relevance, and availability of full texts. Literature searches were performed using databases including PubMed, Google Scholar, ScienceDirect, ResearchGate, and Elsevier. Search terms included: *Pharmacy, Pharmacology, Healthcare Administration, Hospital Management, and Pharmaceutical Care*. Studies outside the thematic focus or lacking accessible full texts were excluded.

Hospital Management and Administration

The healthcare sector plays a crucial role in prioritizing wellbeing seen in service delivery by healthcare providers through defining of pathological condition and medical-surgical interventions [11]. Medical specialization through professional handling is capacitated through financial subsidization to efficiently deliver treatment cost that is handled by patients. Management of healthcare sector has an expanded horizon from the traditional staffing capacity through thorough medical supply chain and ensuring optimal utilization of the pharmaceuticals [12]. Technicalities of pharmacist and pharmacologist from the primary to tertiary levels of health institutions engage public satisfaction via modern trends of facilitating communication in telemedicine and social media especially in developing countries [13]. To actualize these administrative management strategies it involves careful rendering of partnership to ensure availabilities of supplies within the core ethics of pharmaceutical responsibilities. This will aid attending to healthcare priorities and emerging disease surveillance with complicated pathophysiology from the point of emergencies to medical satisfactory discharge [14].

Effectively, healthcare calls for more careful attention as it ensures that important micro to macro part of patient oriented care and wellness are attended to while also focusing on harnessing staff strength to meet up with better outcome. The availabilities of pharmaceutical supplies for daily medical attention of patients both in and out, as first emergency contact involves the use of these

pharmaceutical inductions by doctors and nurses with a knowledgeable pharmacological approach [15]. Optimizing efficiency in healthcare delivery by healthcare providers in the best financial status of healthcare seekers helps to maintain stable financial records and continuity of health institutions in meeting with dwindling cost of purchase of pharmaceutical [16]. Medical care is wellness outcome through quality attention strategies and emergence enhancing the availability of specialized skills professional with maximum remuneration of their services to facilitate smooth running of the system [17].

Evolving Role of Pharmacy and Pharmacology

The concept of pharmaceutical care has been advanced from the drug centeredness to meeting a goal of patient centered oriented care which bridges the communication gap of effective healthcare [18]. It also engages identifying drug related therapy problems and necessitating effective outcome of clinician taking responsibility through effective patient's medical records, comorbid conditions history and synergism for medication therapy management. More effective approach to enhance the administration of pharmaceutical care has enabled a sequential feedback mechanism system emancipated by preformation of definitive therapeutics [19]. Proper diagnosis and how to effectively adhere to prescribed medication outline for maximum recovery which is being built up especially in developing nations where there seems to be a gap. The advancement of knowledge disposal through the aid of artificial intelligence broadens assessment of wide range of emerging disease conditions [20]. The invention of new drug discovery and development through computational pharmacology has quickened physicians to extend confidence and uniqueness of medicines, brand overviews and superiority especially in hospital environment [21]. Enabling pharmacologists to scientifically propose best pharmacotherapy measures to enhance proper treatment outcome and minimizing possible adverse drug reactions [22]. With the ever increasing healthcare needs, pharmacist effective communication of medicines usage due to shortage of staffing capacity especially in public healthcare facilities with high teeming numbers of patients visiting medical facilities will enhance treatment [23]. Hence, the need to actively engage pharmacist to collaborate with other healthcare providers towards providing appropriate medication to the right patient with most deserving compliance with mutual respect, ethics and professionalism [24].

Pharmacology helps in proper medication usage through effective selection, choice of use, effective delivery system, maximizing safety and efficacy on the patient health [25]. This is ensured by ascertaining standardized drug procurement, storage, dispensing, and administration forming the basis for ethical clinical decision making by clinicians for pharmacotherapy patient care. The different roles of pharmacologist and pharmacist involves rational drug usage through well-defined clinical decisions and avoiding drug misuse and abuse with setting the boundaries for safety, efficacy and optimizing outcomes [26]. The absorption, distribution, metabolism, excretion, receptor binding and receptor-like drug action which form the basis for pharmacokinetics and pharmacodynamics helps minimize harmful drug reaction and unnecessary poly-pharmacy [27]. Pharmacologist helps ensure proper procurement plan for quality medicines usage through justifiable inventory and monitoring appropriate drug dispensing and medication error management by awakening patients [28].

The use of medicines has been broadened by the introduction of integrative and complementary medicines combining co-administration of traditional remedies with orthodox medicines [29]. Most synthetic drugs do have specific potency, efficacy and receptor binding affinity determination unlike most remedies that are used especially in developing countries though has been practice over hundreds of years before the advancement of synthetic drug formulation. Setback of traditional medicines has been tagged to poor research findings about plant identification, preparation, compounding pattern, administration and monitoring usage [30]. Showing potency but its specific receptor drug binding like action has low quantification with less promotion but highly used in developing countries [31]. Natural medicines are often perceived to be safer with broader range of remedy coverage have poor preparation based on pharmaceutical and industrial approved standards [33]. However, synthetic drug usage also have more adverse drug reaction reports especially in advanced countries when compared to natural medicines though pharmacologist has played more scientific rebranding role in employing food and drug administration prerequisites [32].

Comparison of Hospital and Community Pharmacy Roles

Different pharmacy dispositions play a helpful path in healthcare depending whether it is a hospital or community based pharmacy. The community pharmacy known as chemist shop traditionally has dominated over the years due to their usefulness to societal wellness and health values

[33]. Its prominence in effective administration of medication advice, health information, proper patient assessment, counseling, observation of drug interaction, supervision of stocks and procurement has brought about pharmacotherapy and health promotion [34]. Collaboration with a trained pharmacist enhances patient safety vaccination advice, guidance to medication and duration of treatment, awareness of emerging diseases, precision medicine and advocacy, over the counter medicine management and subscription to alternative remedies [35]. Pharmacist in hospital settings enables medicine dispensing with optimal collaboration with other healthcare providers in clinical trials and aiding personalized medicine for individuals [36]. They engage in medical procedures of suitable procurement, stocking and adequate shelving for half-life sustainability, educational medical counseling, evaluating benefits that outweighs risk [37]. Though proper medication history scrutiny and medication reviews by pharmacist in ward rounds to ensure proper medication profiling and safety suffers limitations in developing countries [38].

Pharmacy and Pharmacology in Management

Healthcare involves effective leadership qualities and equity with an optimal goal for the betterment of the patient's wholeness through resolving devastating health challenges by efficient teamwork [39]. Enriching patient's satisfaction by mitigating possible challenges following code of ethical conduct and jurisdiction, technological drug screening is carried out based on pharmacological investigations [40]. The role of a pharmacist and pharmacologist could be embedded in directions of management which comprises of clinical, administrative and executive. Clinical system helps to maximize inter professional synergy in meeting patient's needs, administrative focuses on orderly plans in motivating staffing via remunerations rewards, while executive establishes goals that could transcend overtime in promoting good successive structures [41]. The impacts of health services management are diversified yet achievable with tremendous outcomes through good influence of good governance and organized political interference [42]. Maximizing the peculiarities of individual countries in disease tackling techniques and Pharmaceutical care should be enhance through adequate checks of medication profiling [43]. There is need to incorporate the private health sector into vital health ministry organograms to enable universal health coverage and solving other environmental factors in essential health demand [44].

The system of healthcare management ensures welfare are optimize with appropriate planning, controlling, remuneration, staffing, critical thinking by various managerial focus achieved by community engagements, initiatives and programs [45]. Determinants of healthcare involving social-cultural, personal and environmental contribute to direct and indirect impacts of leadership skills [46]. Effective health communication is realized in cordial prescriber-patient interaction as patient's priority and health needs are attained through critical diagnosis [47]. Consistent areas being consider by medical expertise on diagnosis, physical examination, treatment of disease based on scientific training and consideration of patients personal belief system has impact on health [48]. Mental, social, work life, education, marital and physical cognizance of health seekers impacts critical health decision making [49]. Incorporating empathy into care is adjudged by conscience while training pharmacist and pharmacologist in shaping the future of pharmaceuticals [50].

Scope of Pharmacy and Pharmacology in Pharmaceutical Process

Quality of medicines based on pharmaceutical standard procedures ensures products undergoes various testing and assays before getting to the patient leading to potency, efficacy and shelf life [51]. Pharmaceutical products are set on stage by various process of quality assurance through various documented procedures to bring quality to patient's health while avoiding fake products by regulatory agencies [52]. It entails risk characterization, assessment, deviation management, supplies, preventive and corrective measures to ensure standards, improve patient medical delivery and administration [53]. Quality of product visibility is due to its effects in management of disorders without reducing life expectancy [54]. Producing quality products involves planning for specifications with structured outlines, assurance of beating production acceptable standards, control measures for safety and efficacy of medicines for patients use and improvements to set excellence through best practices [57].

Challenges and Perspectives of Healthcare System

The Nigeria healthcare system is pluralistic in management strategy based on public, private and joint partnership healthcare system [58]. Private sector funding depends on substantive ownership capital base systems [59]. Public sector which the larger population percent is able to afford base on cost of pharmaceutical products and expenses of healthcare is under staff with medical personnel's, poorly financed and inadequate technological equipment for various specialties [60]. Control, ad-

ministration and management of health sector in Nigeria is regulated by the federal ministry of health through policies, formulations and established acts of institutions in federal teaching hospitals, research institutes and medical centers. While States highlights secondary healthcare services in establishment of general hospitals but also tertiary teaching hospitals while promoting primary health centers in line with local government collaboration in the campaign for fight against killer diseases such as malaria, HIV/AIDS, tuberculosis and engaging in effective vaccination programs [61]. Local government authority engages rural in effective healthcare support, attention and services through antenatal care and immunization against childhood killer diseases. Health insurance services are also run by the state government but with less patronage from the population due to low remuneration and lack of confidence in the public healthcare institutions [62].

Policy and Legal Frameworks

Individual's good health brings better productivity base on physical reflection, psychological stability, financial viability, emotional balance relief from painful events and good behavior sanity for a better life. Medical and pharmaceutical industries are modernized by effective legislature, policies, constructive governance and defined professional responsibilities through stakeholder's engagement, pharmaceutical ethics of informed consent, beneficence, non-maleficence and equity frontiers disease management and control[63]. Legal framework helps in establishment of healthcare and medical institutions to launch universal health strategies through proper provisional funding [64]. Formulating goal oriented policies, provision of pharmaceutical supplies, management of health information, networking of health institutions, risk assessments leads to standardized healthcare system [65]. Health workers and patient's integrity are guided by policies in recognition of critical health procedures, research, reproductive health matters and mental rehabilitation proficiency [66].

Health policies are also political strategies in pharmaceutical care seen in adhering to lifestyle modification therapy through avoidance of tobacco usage to reduce respiratory diseases, proper dietary in reducing diabetes [67]. Poor infrastructural development, low level of income, poor educational status are part of measures to be properly checkmated to ensure a healthy society [68]. Policies formulations depend on duration of organizational targets which influences the society by effective governance implementations and developed behavior irrespective of socio-political grounds [68]. Discretion of information sharing with other healthcare providers, benefit for the community, source of financing, health protection, registration of healthcare facilities, training and practice conduct, safety and efficacy of medicines upholds patients right in addressing communicable and non-communicable diseases [69].

Conclusion

Pharmacy and pharmacology play indispensable roles in healthcare administration and hospital management. Their integration enhances patient safety, rational pharmacotherapy, and institutional efficiency. Strengthening collaborative frameworks and policy recognition of these disciplines is essential for advancing healthcare systems.

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