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Analysis of the state of medicine in Pakistan: challenges and future prospects

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Abstract

Aims: This article examines the condition of medicine in Pakistan utilising existing scientific articles, reports, and other published information in order to describe the position of the country regarding medication quality and the presence of deprived and/or false pharmaceutical preparations.

Methodology: In this study, studies concerned with the condition of medicine in Pakistan have been systematically searched. The most sustainable recent studies on the condition of medicine in Pakistan in PubMed, Medline, the Cochrane library, EmBase, and Google Scholar were evaluated for this systematic review. The search criteria were [Medicine or drug] AND [analysis] AND [Pakistan]. To guarantee the caliber and consistency of the selected articles, many criteria were utilised for article eligibility, in accordance with the PRISMA principles and critical assessment tools.

Results: The authors first retrieved 750 papers for use in electronic databases. These publications were then once again compared to the study's goals, and any that didn't fit the bill were disregarded. After further screening 40 publications were chosen and dispersed to the authors for additional evaluations. The authors' detailed brainstorming session resulted in the inclusion of 18 pertinent papers in the review.

Scientific Novelty: This is the first systematic review performed in Pakistan in order to highlight the state of medicine.

Conclusion: The research suggests that to effectively regulate substandard and counterfeit medication in Pakistan, regulatory procedures for facility inspections and Good Manufacturing Practices (GMP) assessments, analytical laboratories, and capacity building, all need to be strengthened. The material that is currently available cannot support the claim that 40–50% of Pakistan's medications are of low quality. The primary causes of the subpar services provided by community pharmacies include a lack of competent personnel, a lack of advice, and a lack of professionalism on the part of the dispensers, as well as the vagueness of rules and how they are applied.

Keywords: medication quality, PRISMA, systematic review, good manufacturing practices.

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Introduction

Due to the country's poor financial, economic, and environmental conditions, health issues in Pakistan are on the rise every day, and treatment options are limited [1]. The main cause of poor health conditions is the poverty. Past researchers have established a clear causal connection between poverty and health [2]. Citizens must be well-educated, benefit from a robust economy, have access to the newest technologies, and most importantly, have a constant and established contact with medical specialists in order to combat numerous diseases and health issues [3]. People in Pakistan shy away from patronising state-run hospitals because of their "poor quality" and "unreliability." [4]. The WHO states that in order to reach the greatest level of human health, the availability of critical medications that are safe, effective, and of high quality is important [5]. However, reports of regular drug lacks from high-income, middle-income, and low-income nations have been made. [6]. According to the WHO, about 2 billion people have no access to basic medications [7] which results in subpar medical care and expensive financial consequences. In order to satisfy patient and public health demands, the WHO defined medication deficit as "the supply of medicines, health products, and vaccines identified as essential by the health system is considered to be insufficient" [8]. A lack of medicines according to the US Food and Drug Administration (FDA), is a period of time when demand or projected demand for the medication outweighs supply [9]. The lack of access to medicines is not a recent problem, but its scope and severity have grown in recent years [10]. According to the American Society of Health-System Pharmacists (ASHP), by the end of 2017, 146 pharmaceuticals were in limited supply (this number rose to 224 by the end of June 2018) [11]. According to a Canadian research from 2018, there were yearly shortages of about 1000 medicines [12].

Research Problem

Since a very long time ago, Pakistan has been addressing the threat posed by subpar medications. The Drugs (Generic Names) Act (XXIV of 1972), which established the generic policy, was revoked in 1975 as a result of the suspension of 38 pharmaceutical companies for creating inferior medications [13]. The Drugs Act of 1976 established fines (100,000–100,000 Pakistan Rupees, or $707–7067 USD) and legal penalties (five–ten years in jail) to prohibit drug counterfeiting as well as the sale and manufacture of medications without a licence and market authorisation. Along with post-earthquake rescue activities, the WHO established a network for the distribution of medications in 2005 with the intention of identifying and resolving quality and supply problems in the affected areas as soon as possible [14]. Several organisations nationwide implemented the WHO prequalification programme [15], this improves the delivery of medications of the highest calibre. In a local study, there was no discernible difference in the amount of time needed for smear conversion between locally produced, multiple drug resistant tuberculosis drugs purchased through the medicine prequalification programme and the 15-20% more expensive, internationally quality assured medicines [16]. The lack of resources is a major factor in weak regulatory controls, particularly when it comes to the analytical testing of medications. To ensure the population's continuous access to high-quality drugs, Pakistani regulators and researchers need to be informed about the affordable technologies and strategies associated to establishing cost-effective policies. This synthesis can act as a catalyst for regulatory system change in Pakistan and make it simpler to provide safe and efficient pharmaceuticals to the general public.

Research Focus

In Pakistan, 40–50% is the most often cited estimate for the incidence of subpar medications [17]. However, this statistic has come under fire for lacking factual information in another publication on the overall quality of Pakistani drugs [18]. Regarding the failure rates reported by Pakistan's public sector Drug Testing Laboratories (DTLs), little information is known. Evidence-based policies are essential for making the best technological decisions and for building the technical expertise needed to look into problems like adulterants, pharmaceutical contaminants, and performance difficulties. To provide such evidences, researchers with experience in policy, regulation, and analytical methods collaborate closely. The prevalence of low-quality medications is well-documented in international literature, mostly from sub-Saharan Africa, where the accessibility of basic field data has enhanced awareness of the issue and inspired resources to devise remedies through internal and external initiatives. In Pakistan, the provincial governments are in charge of distribution and sales while the federal government manages licensing, production, registration, pricing, and imports and exports of pharmaceuticals [19]. International analysts consider this decentralised regulatory control as a fundamental weakness in the system [20]; the issue worsened when the 18th amendment to the Pakistani constitution moved drug regulating power from the federal government to the provinces [21]. Provinces through the Council of Common Interest eventually issued a "no objection" certificate, reversing the judgment. Along with drug control, the Higher Education Commission is another entity that was subject to government regulation [22].

Research Aim and Research Questions

This review's primary objective is to analyse the state of medicine in Pakistan using data that is currently available in reports, scientific publications, and other published sources that can be helpful in describing the situation of the country with the regard to the quality of medicines and the prevalence of substandard and/or counterfeit medical products. The challenges and future prospects of state of Medicine in Pakistan will be highlighted.

Research Methodology

General Background

This study involves a systematic search for studies related to state of medicine in Pakistan. For this systematic review, PubMed, Medline, EmBase, the Cochrane library, and Google Scholar articles were searched for the most current research on state of medicine in Pakistan. The terms [Medicine or drug] AND [analysis] AND [Pakistan] were used as search criteria. Searches were restricted to English language articles only. The relevancy of the titles, abstracts, and keywords was checked by two independent reviewers. Publications having titles or abstracts that complied with the requirements for this systematic review were chosen for a more thorough examination. Before adding the article in the research, the whole text of each article was read in case there was any ambiguity. Articles were chosen for evaluation if they had described the rational drug use in Pakistan, the contributing reasons to it, and the results of that rational usage. Articles that failed to include any of the aforementioned points were excluded from this research (Table 1).

Table 1. Inclusion and exclusion criteria for studies

Inclusion criteria	Exclusion criteria
Studies on state of medicine or drug in Pakistan	Anything not including the listed topic
Peer reviewed scientific articles	Anything other than peer-reviewed articles and literature
English language research	Publications in languages other than English

Author's development

Data Analysis

The current study conforms to all advised research ethical standards. The Research Ethics Committee did not formally authorise this study since it was a review of the findings of other previously published publications that were available to the public.

Results

A number of standards were utilised for the article's eligibility, as listed in Table 1, in accordance with the PRISMA principles and critical assessment tools to guarantee the calibre and consistency of the identified articles. The authors first retrieved 750 papers for use in electronic databases. These publications were then once again compared to the study's goals, and any that didn't fit the bill were disregarded. 40 publications were chosen after further screening and dispersed to the authors for additional evaluations. A comprehensive brainstorming session by the authors led to the inclusion of 18 pertinent articles in the review (Figure 1).

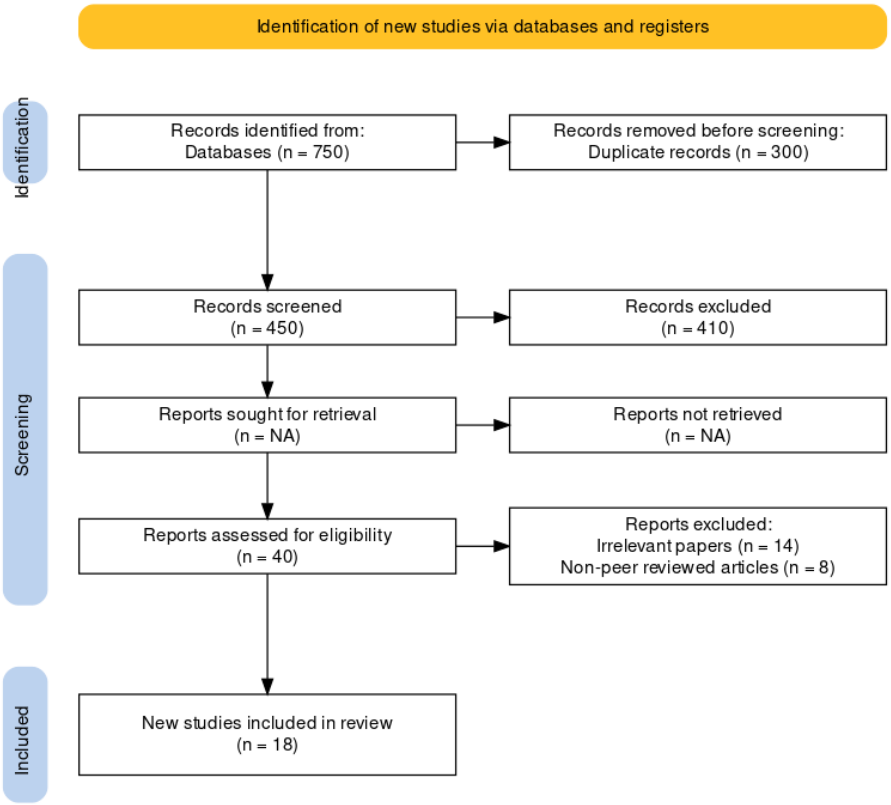

Figure 1. **The PRISMA flow chart of the literature selection for the systematic literature review (author's development)**

Discussion

Pakistan has a standard pharmaceutical distribution network. The pharmaceutical industry produces drugs, which are at that point moved to merchants and wholesalers, put away at retail areas or healthcare offices, suggested by doctors, managed at drug stores or restorative supply stores, and at last given to and expended by clients [19]. The Drugs Act of 1976 directs the purport of crude materials, fabricating, capacity, dissemination, and deal of drugs all through the country (XXXI of 1976). The Sedate Administrative Specialist of Pakistan (DRAP) is mindful for guaranteeing that the Drugs Act of 1976 is executed [19, 23]. The DRAP contains a committee on the accessibility of life-saving drugs that bargains with therapeutic deficiencies especially. Need of execution of existing approaches, a tireless arrangement crevice between the pharmaceutical industry and the wellbeing segment, a hurried enlistment prepare, a lack of cost control, a need of a web notice framework, and inadequately sentencing strategies for non-compliant partners are what cause pharmaceutical deficiencies in Pakistan, in spite of the nation having an administrative specialist [24, 25]. Within the private division, sound medicine is "famously troublesome," concurring to the World Wellbeing Organisation, since of variables counting quiet request, medicine advancement, and sedate vendors' self-interest in making a benefit. According to the research, interventions that are suited for improving practises may be sustained and become more affordable if they are scaled up [26]. The issue is widespread and ingrained. Due in part to a lack of understanding of the scope of the issue and the associated financial and health consequences, few nations presently monitor the improper use of drugs, and decision-makers frequently lack the knowledge necessary to address this issue in the most efficient manner. Whereas this can be going on, a few countries need the human and budgetary assets essential to energise more exact demonstrative procedures, to put in put viable control of medicine and apportioning behaviour, and to empower persistent adherence to treatment in both the open and private divisions. Additionally, the high cost of medications makes it difficult for patients to stick to suggested dosages; according to some research, 90% of consumers purchase antibiotics for three days or less [27].

According to another source, the minimum number of prescription medications documented was 5, exceeding the WHO guideline of two prescription drugs. This only demonstrates the tendency among doctors towards polypharmacy, which is a significant contributor to irrational usage. The dosage of a drug and its side effects are closely related. Up to 22% of dose mistakes, which account for 50% of reported side effects that might have been avoided, were the most frequent form of prescription errors. Additionally, this study reveals significant frequencies of medication interactions and duplication. Patients had to pay for 70% of the medications. The high cost may cause therapeutic non-adherence. It has been noted that prescribing many antibiotics–typically third generation antibiotics–was a regular practise. The primary cause of the evolution of bacterial infections with

resistant strains is the overuse of antibiotics [28]. A study publication reported that 31% of medications had incorrect dosage or did not specify how often they should be taken. Both are crucial for the most effective therapeutic approach. The length of treatment, which is significant for the administration of a few disarranges counting jungle fever and anti-microbial treatment, was not said when 12.56% of solutions were managed. It was discovered that the prescription contained superfluous medications with no indication. It was observed that the patients had a variety of illnesses, and the prescription's treatment of certain issues was completely disregarded [29].

According to WHO recommendations, each medication should have an appropriate label that includes the patient's name, the dosing schedule, and the medication itself. Even though it is very desirable that all pharmaceuticals be correctly labelled, a survey revealed that just 3.96% of them were. It was discovered during patient interviews that the majority of them were unsure of the precise timing of their medication intake. In three of the four facilities, not even one medicine had the necessary labelling. Unfortunately, compared to the desired value of 100%, the patient's awareness of the proper dosage of medications was low (54.98%) [30]. Agreeing to a journal, the normal rate of nonexclusive drugs endorsed was 29.7%, which is lower than the WHO benchmark values of 100% and outlines the doctors' inclination for brand-name medicines. While the WHO's International Networking for Rational Use of Drugs (INRUD) set a limit of up to 30%, the average proportion of administered antibiotics was 64%, demonstrating how all healthcare institutions contribute to bacterial resistance to antibiotics. In Punjab, patient counselling was not performed prior to dispensing during the average dispensing time of 88.5 seconds in hospitals. In Punjabi hospitals, 82.9% of prescriptions were really filled; hence the remaining patients were directed to local pharmacies for their medication needs. Due to low literacy and carelessness during the prescription and administration of medications, there were only a small proportion of patients who accurately knew the amount of their medications [31].

According to a self-administered, descriptive cross-sectional survey, the most prevalent conditions for which people use drugs without first consulting a doctor are headache (96.52%), fever (80%) and minor cuts and wounds (85%). The self-medication is more common with drugs used for minor injuries than it is with antibiotics. The survey participants saw the print and electronic media advertising as a source of encouragement for self-medication with OTC headache medications in addition to cough, cold, and fever. However, this study exposes a dangerous scenario in which some individuals misuse cough and cold medications to induce sleep in a compulsive manner, despite the fact that insomnia was not professionally diagnosed in them. Concerns about the toxicity of cough syrups used for self-medication are growing. The previous research demonstrates that Pakistan's inappropriate prescription and usage of antibiotics has contributed to the evolution of resistant forms of bacteria [32]. The average consultation and medication dispensing times are insufficient for giving patients advice on how to use their medications, and the safety and storage requirements for dispensing are insufficient. In the private sector particularly in rural regions, irrational usage is more pronounced. Evidence shows that 6–11% of people regularly use antibiotics for self-medication [33]. It is widely acknowledged that a rational drug usage is the crucial component of health policy. The guiding concepts or criteria are efficacy/effectiveness, accessibility, and safety. Irrational drug usage can take many various forms, such as when prescribed medications are unavailable or when a prescription is written incorrectly. The access to drugs is another issue while trying to maintain or enhance health. Additionally, it raised the mortality and morbidity rates and encouraged the use of sterile injections, which widened the range of blood-borne illnesses like hepatitis. Within the constraints of the available resources, we must enhance the responsible use of pharmaceuticals in order to reduce these issues. The WHO first proposed the "Essential drug" idea in 1970, arguing that a small number of pharmaceuticals would result in improved drug supply, better prescription, and cheaper healthcare costs [34].

There are genuine drug-related issues in Pakistan. Whereas the showcase is overwhelmed with strange pharmaceuticals, numerous of the "Fundamental Drugs" that frame the premise of sound endorsing are not promptly accessible. A record number of formulations—about 50,000—have been registered in Pakistan. The problem is made worse by the market's unfettered distribution of fake and outdated medications. Studies conducted by the editorial's author on prescription patterns revealed a very high rate of medication abuse and illogical usage by doctors in Pakistan's public and private sectors [35]. Common instances of irrational drug use include prescribing excessive amounts of medication (polypharmacy), injecting patients when oral medication is sufficient, prescribing antibiotics with inappropriate dosages and treatment durations, disregarding proper clinical guidelines when writing prescriptions, and patients who fail to follow treatment plans in full or self-medicate. The socioeconomic situation in a poor and growing nation like Pakistan is unsatisfactory, and individuals need to be informed on how to utilise medications properly as well as paramedical workers. The consequences of irrational drug use include inappropriate drug prescribing that may increase morbidity or mortality rates, lead to drug resistance, or waste resources and essential medications, increase the availability of or prescription for drugs with a disproportionately high number of side effects, and influence patient behaviour that there must be a drug for every ailment, which may result in irrational drug use [36, 37]. This systematic analysis indicates that regulatory processes for facility checks and Good Manufacturing Practices (GMP) assessments, analytical labs, and capacity development all need to be improved in order to successfully control substandard

and counterfeit medicine in Pakistan. The assertion that 40–50% of Pakistan's medications are of poor quality cannot be backed up by the information presently accessible. The main reasons community pharmacists offer subpar services are a lack of knowledgeable staff, a lack of advice, a lack of decorum on the part of the dispensers, as well as the ambiguity of the rules and how they are implemented.

Conclusions and Implications

In this review the situation of medicine in Pakistan has been examined.

1. The research suggests that in order to effectively regulate substandard and counterfeit medication in Pakistan, regulatory procedures for facility inspections and GMP assessments, analytical laboratories, and capacity building, all need to be strengthened.
2. The material that is currently available cannot support the claim that 40–50% of Pakistan's medications are of low quality.
3. The primary causes of the subpar services provided by community pharmacies include a lack of competent personnel, a lack of advice and a lack of professionalism on the part of the dispensers, as well as the vagueness of rules and how they are applied.
4. It is proposed that in arrange to assemble vital measurements around subpar and fake medications in Pakistan, efficient objective information must be created through well-planned, financed ponders.
5. The country is moving rapidly towards distant better administrative system, but for a smooth move to a well-regulated framework, it is necessary to have a complete, long-term vision that is interdisciplinary, open, dynamic, and evidence-based. Each exertion ought to be made by the government to energise the utilisation of basic medications in both the private and public sectors.
6. The government wellbeing offices and the government ought to do their hardest to kill that loathsome sickness and follow to WHO rules to ensure the proper medicine use in Pakistan.

Declarations

Author contributions

All authors have sufficiently contributed to the study and agreed with the results and conclusions.

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Ethical statement

This study does not require IRB approval as it does not involve human subjects/data.

Declaration of interest

No conflict of interest is declared by authors.

Data sharing statement

Data supporting the findings and conclusions are available upon request from the corresponding author.

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