Integrated Pharmacy Research and Practice

Dovepress
open access to scientific and medical research

Open Access Full Text Article

REVIEW

Access to Medicines and Pharmaceutical Policy in Saudi Arabia: A Scoping Review

Ahmer Hameed Mirza[1,2], Abdulmajeed Alqasomi[2], Faris El-Dahiyat[3], Zaheer-Ud-Din Babar[1]

[1]Department of Pharmacy, University of Huddersfield, Huddersfield, UK; [2]Department of Pharmacy Practice, College of Pharmacy, Qassim University, Buraydah, Saudi Arabia; [3]Al Ain University, Al Ain, United Arab Emirates

Correspondence: Ahmer Hameed Mirza, Department of Pharmacy Practice, College of Pharmacy, Qassim University, Buraydah, Saudi Arabia, Email Ahmer.mirza@hud.ac.uk; Ah.mirza@qu.edu.sa; Zaheer-Ud-Din Babar, Department of Pharmacy, School of Applied Sciences, University of Huddersfield, Huddersfield, UK, Email Z.Babar@hud.ac.uk

Introduction: This scoping review includes studies on pharmaceutical access, shortages, generics, availability, pharmacoeconomics, and pricing restrictions. The study's findings may aid in developing excellent pharmaceutical and access policies in the country.

Objective: To conduct a scoping review documenting access to medicines and Pharmaceutical Policy in Saudi Arabia.

Methodology: The PRISMA-ScR guidelines were used to perform a scoping review. The articles were screened using databases from Google Scholar, EBSCO, Science Direct, and the University of Huddersfield Library. The selection, aims, results, and conclusion of each original research publication published between 2010 and 2022 were evaluated. To categorize the articles, a theme analysis was done.

Results: This study includes nineteen publications. The chosen articles revealed four themes. Among these topics were: Access to medications 36.84% Pharmacoeconomic 36.84%), which were the predominant theme followed by Generic Medicines 15.80%, and Cancer drug financing 10.54%. There are myriad challenges related to high-cost medicines. Access restrictions to medications have significant effects on patient morbidity and mortality; as a result, policy decision-makers frequently consider this issue. Access to medicines suffers budgetary limitations and the increasing cost of innovative medicines. Access to medicines for all patients could be significantly impacted by delays in patient access to new therapies.

Conclusion: The available evidence revealed that Saudi Arabia's healthcare system has numerous issues ranging from cancer drug financing, medicine shortages, and access issue. In order to achieve the highest health standards possible, it is crucial that each individual has access to medicines and has the financial, physical, and social means to do so. However, the price of some medications can be prohibitive for people who need to obtain them. The study's outcomes could help the country develop pharmaceutical and access policies related to medicines.

Keywords: Saudi Arabia, medicines policy, pharmaceutical, drugs, access

Introduction

Access is an essential term in health policy research that must be defined and applied efficiently. According to researchers, "access" refers to a patient's capacity or desire to enter or utilize the healthcare system some describe as the variables affecting entrance. In both health policy and health service research, the concept of access is crucial.[1] In order to achieve the highest health standards possible, it is crucial that each individual has access to medicines and has the financial, physical, and social means to do so. According to one definition of pharmaceutical policy, it is a subset of health policy that "deals with the principles guiding decision making in the field of pharmaceuticals"[2] in order to advance the general health and wellbeing of every society within a healthcare system.

There are many different aspects of pharmaceutical policy, including licensing, pricing, formulary management, prescribing, pharmacy services, rational drug consumption, pharmaceutical economics, access, and affordability of medications. Maximizing access to medications, ensuring the quality of pharmaceutical products, managing the cost of medical care and medications, and encouraging responsible drug use are the overarching goals of pharmaceutical policy.[3] However, the price of

Received: 25 March 2023
Accepted: 3 July 2023
Published: 15 July 2023

some medications can be prohibitive for people who need to obtain them. Access to medications is restricted, which has significant effects on patients' morbidity and mortality.[4] For this reason, policy decision-makers frequently discuss this issue.

Saudi Arabia has a population of 35.84 million (about twice the population of New York) as of March 2022.[5] By 2050, it is expected to be 77.2 million population.[6]

Saudi Arabia is ranked 26th out of 191 nations by the World Health Organization for total healthcare performance and is seen as an example for other countries. By 2050, Saudi Arabia's male and female life expectancies are anticipated to rise from 73.1 to 78.4 years of age and 76.1 to 81.3 years of age in both genders.[6]

The Saudi Arabian healthcare system has significantly developed during the past 70 years.[6] The Ministry of Health offers primary, secondary, and tertiary health services. In order to refer patients who need more complex care to Government hospitals (the secondary level of care), primary healthcare facilities offer both preventive and curative primary care services. Patients who require higher levels of treatment, in contrast, are moved to central or specialty hospitals (the tertiary level of healthcare).[7]

Modernization has led to the establishment of a vast network of medical institutions, including thousands of polyclinics and hundreds of hospitals. Diabetes is the primary reason for mortality in Saudi Arabia (36%), followed by road traffic accidents (32.3%), ischemic heart disease (25.4%), and chronic renal disease (25.1%).[8] Saudi Arabia has a three-tiered healthcare system. All citizens and government employees are entitled to free medical and pharmaceutical care. The entire cost of healthcare in 2018 was estimated to be 37.7 billion US dollars (141.375 billion Saudi Riyal).[8]

Saudi Arabia is undergoing a massive economic transformation (2030 economic vision), posing unique challenges to the labor market and healthcare system.[9] Large demand swings affecting the international market and supplier concerns are all causes that contribute to global drug shortages.[9] For example, Saudi Arabia's causes of the shortage of drugs are low commercial margins, poor pharmaceutical supply administration, and weak and inefficient law-violation sanctions against pharmaceutical businesses.[10]

Shortages of drugs are a big issue having a detrimental impact on patients' health and necessitates immediate action by healthcare authorities.[11] Local pharmaceutical companies produce only about 16% of domestic medications in Saudi Arabia. However, Saudi Arabia purchases roughly 59.4% of all pharmaceuticals in the Gulf region.[12]

Saudi Arabia's healthcare system has seen significant development in recent years. This change was significantly influenced by the government-private partnerships that received increasing focus in the Saudi 2030 Vision plan. Putting the Vision 2030 plan into action, which focuses on primary preventative healthcare and increases the private sector's participation in delivering these health services, was established by introducing an initiative that incorporated private community pharmacies in medication provision.[13]

A system for electronic prescribing named "Wasfaty" was introduced in 2018 in government healthcare facilities at the primary and secondary levels. According to the definition of e-prescribing "the direct computer-to-computer transmission of electronic prescriptions (e-prescriptions) from the prescriber office to community pharmacies".[13]

The wasfaty portal is used by doctors to initiate e-prescriptions, which are then electronically forwarded to neighborhood pharmacies so that patients can get their free drugs and other healthcare items. The free of cost prescriptions are for Saudi Arabian Citizens and eligible expatriates. These are primarily for those medicines which are not available at hospital pharmacies. To provide simple access to the neighborhood pharmacy, the program establishes connections between primary healthcare facilities and hospitals and a few chosen community pharmacies in different places.[13] The services also seek to increase patient medication counseling, decrease drug waste, increase medication availability, and improve health spending efficiency.[13]

A pharmaceutical policy provides and uses pharmaceuticals in a healthcare system.[14] The current study examines pharmaceutical policy and access to medicines issues in Saudi Arabia. Even though local pharmaceutical manufacturing has surged in the past ten years, according to some estimates, domestic manufacturers barely cover 20 to 25% of the prescribed medicine use, despite over thirty-two registered and twenty-seven operational pharmaceutical industries.

As a result, corporate and government funding in critical areas of the medicines manufacturing market, including vaccines, biologics, and chemotherapeutics drugs, need to be increased to meet the country's need for essential prescription medications.[15]

The purchasing expenditure will increase the drug's rising price and limited availability.[16] A Precision Business Insights poll revealed that, the pharmaceutical business was 5.75 billion US Dollars in 2017 and is predicted to increase to 6.7%, reaching 8.46 billion US Dollars by 2023.[16]

The Kingdom's rising population and self-awareness regarding health and pharmaceutical products are some of the contributing factors leading to increased expenditure on healthcare.[17] European, American, and Indian corporations have already constructed manufacturing facilities, particularly in the King Abdullah Economic Industrial Area manufacturing a wide range of pharmaceuticals such as Antimicrobials, Antidiabetic drugs, Anticoagulants, and Cardiovascular drugs. In addition, there are opportunities for other manufacturers to produce Biological, Vaccines, and Parenteral medications.[17]

The generics sector is increasing quickly as a result of the Saudi government's measures in the recent past to lower pharmaceutical costs and increase local manufacturing.[17] Access to medicines suffers budgetary limitations and the increasing cost of innovative medicines. This scoping review discusses medicine access, shortages, generic medication, availability, pharmacoeconomics, and pricing regulations. The study's outcomes could help the country develop good pharmaceutical and access policies.

Objectives of the Study

To conduct a scoping review documenting access to medicines and pharmaceutical policy in Saudi Arabia.

Method

Study Design and Eligibility Criteria

To find published literature, a scoping review utilizing PRISMA-ScR guidelines[18] was carried out. The term "access" refers to a broad notion encompassing acceptability, availability, accessibility, affordability, price, and reimbursement and was used to select and include research in this scoping review.[19] This review contains any related research that looks at access (perceived or actual) or any components that make up the idea of access. Only the original studies conducted in Saudi Arabia and English Language are included. The studies included were published from June 2010 to July 2022. Letters, opinions, systematic reviews, and editorials that are not original; also, the non-peer-reviewed journal research did not aim to investigate access to medicines and pharmaceutical policy in Saudi Arabia were excluded.

Patient and Public Involvement

None.

Information Sources Searched

The Author conducted a literature search of published publications from 2010 to 2022 in four health-related databases: Google Scholar, EBSCO, Science Direct, and The Library University of Huddersfield database. Until July 2022, 286 articles were retrieved.

Search Strategy

The development and use of a search strategy. These keywords were used in a search that was limited to the English language: The keywords used were "Saudi Arabia", "Medicines Policy", "High-cost medicines", "Pharmaceuticals", "Drug shortage", "Drugs", "Regulation", "Policy", and the "Medicines", "Access", "Availability".

Study Selection

We checked and eliminated duplicate articles. Two reviewers checked the research' titles and abstracts for eligibility and applicability. Three groups—included, excluded, and uncertain—were created from the articles. When unsure whether an article should be included, the complete text was retrieved and independently examined by the two authors/reviewers to determine the eligibility status of the article. If the disagreement persists, a third expert was enlisted to offer advice. The eligibility of all included articles was evaluated by full-text screening after the irrelevant articles had been eliminated. The following criteria were used to eliminate publications: non-original articles such as comments, letters, case reports, surveys, editorials, review articles, unpublished articles, or articles that were published in a language other than English or in a country other than Saudi Arabia.

Data Charting Process

Title, authors, research or study design (including any methodology), study location (hospital, community pharmacy, general pharmacy, educational institution, or public context), associated countries, and technique, if any The information that was gathered and tabulated from each study includes information on the access to medicines, the pharmaceutical policy domain it covers, the date of publication, the publishing journal, and the study objectives.

By assessing the research' goals or aims, linked papers with similar goals were gathered into one category, and after the categories were analyzed, the themes were created.

Synthesis of Results

The information was evaluated thematically in accordance with the area of "Access to medicines and pharmaceutical policy." The results of the synthesized analysis were presented as frequencies and percentages.

Results

Study Selection

For all of these keywords, Google Scholar found a total of 21,473 articles, EBSCO 2909 articles, Science Direct 1700 articles, and the Huddersfield Library 1696 articles. All databases yielded a total of 27,778 articles. The research on access to medicines and pharmaceutical policies challenges in Saudi Arabia was searched. The titles and abstracts were evaluated to screen the papers for suitability.

Out of 27,778 titles/abstracts found through database and journal searches, we found 19 articles in English after deleting duplicates and material unrelated to Saudi Arabia's pharmaceutical policy and access to medicines. All publications were examined thoroughly against the study's eligibility criteria. The process how these studies were selected is explained in the Prisma Flow Diagram as shown in Figure 1. Three studies were excluded based on their publication year, and four studies were excluded because they were not original research publications. The principal author evaluated the remaining studies for relevance to Saudi Arabia's medications and pharmaceutical policy access. Finally, only 19 studies total were selected for the analysis. All 19 studies are presented in Table 1. The non-peer-reviewed journal research did not aim to investigate access to medicines, and pharmaceutical policy in Saudi Arabia was excluded. The review only included original research articles.

Included Studies Characteristics

All 19 original research articles were assessed in selection, objectives, results, and conclusion. Two researchers independently extracted data using the extraction table All Data was compared, and any differences were discussed. Access to medicines and pharmaceutical policy difficulties in Saudi Arabia, drug shortages, availability, pricing policies, outcomes measured, and a summary of the findings are among the conditions associated with the retrieved data. The information retrieved from the 19 articles yielded essential themes. Among these topics were: Generic Medicines, Access to medicines, pharmacoeconomics, and Cancer drug financing.

The number of Included articles were published in 2010,[1] 2013,[1] 2014,[1] 2015,[1] 2016,[3] 2017,[1] 2018,[1] 2019,[1] 2020,[6] and in the year 2021.[3] Figure 2 shows the distribution of the selected articles over the years.

Figure 3 shows that Nineteen articles were included in this study. The chosen articles revealed four themes. Among these topics were: Access to medicines and Pharmacoeconomics were the predominant theme, 36.84%[7] pharmacoeconomics 36.84%,[7] followed by Generic Medicines at 15.80%,[3] and Cancer drug financing 10.54%.[2]

Four Themes Were Revealed by the Thematic Analysis

1. Theme 1: Generic Medicines.
2. Theme 2: Access to Medicines.
3. Theme 3: Pharmacoeconomics
4. Theme 4: Cancer drugs financing.

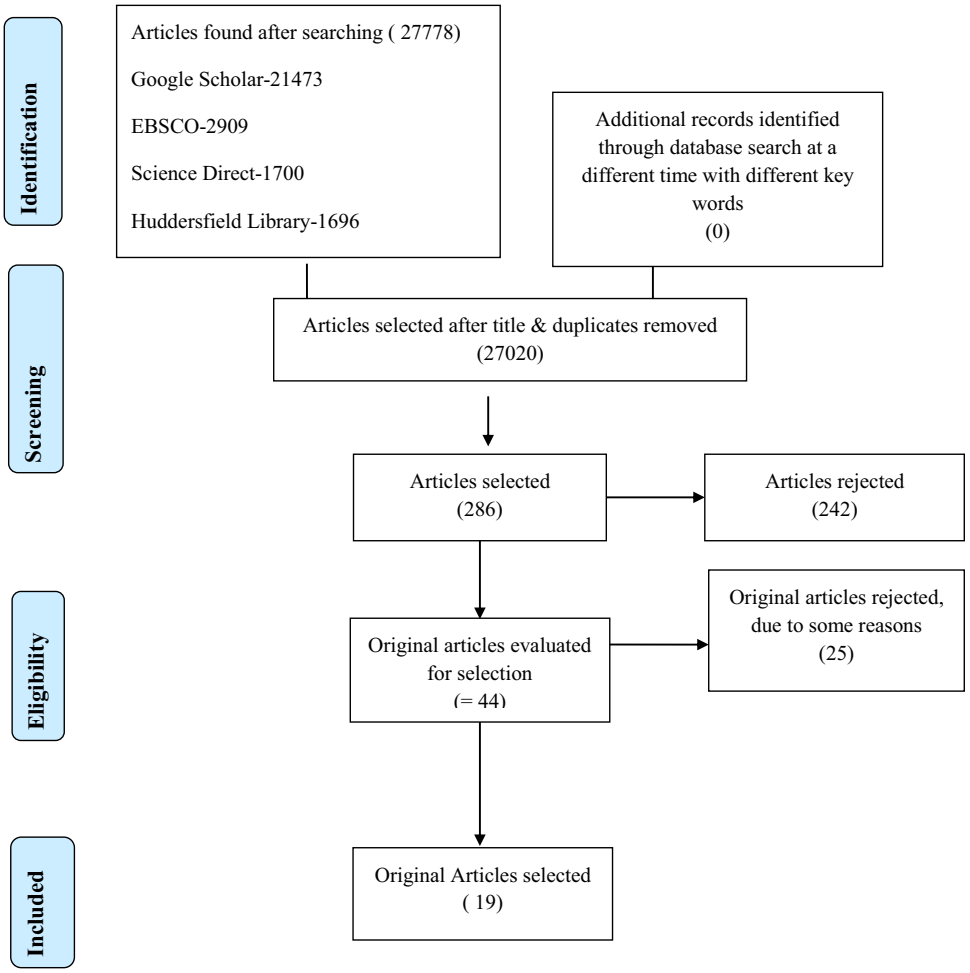

Figure 1 PRISMA Flow Chart.
Notes: PRISMA figure adapted from Tricco AC, Lillie E, Zarin et al PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. *Ann Intern Med*. 2018;169(7):467–473. Copyright © 2018 American College of Physicians. All Rights Reserved. Reprinted with the permission of American College of Physicians, Inc.[18]

Theme 1. Generic Medicines

A cross-sectional study was carried out in Makkah region of Saudi Arabia, between the months of February and March 2016. To evaluate the knowledge, attitude, perspective, and current practices of Saudi Arabian community pharmacists on the substitution of generic medications. The poor utilization of generic medications in Saudi Arabia may be partially explained by the apparent knowledge gaps among community pharmacists regarding generic medications and their substitute. To reduce the price of medications and total healthcare spending, healthcare officials must increase public awareness of the safety and effectiveness of generic medications and encourage their usage.[20]

According to a study done in Taif, Saudi Arabia, the general people may not be aware of generic medications or generic substitute [20]. Furthermore, branded medications were favored over generic ones by more than half of the study's participants [20]. Similar to this, a different study that assessed doctors' perceptions of and attitudes toward generic drugs in Riyadh, Saudi Arabia, suggested that prescribers' lack of knowledge of generic drugs was one of the main reasons for the low rate of generic drug prescribing [20]. Community pharmacists voiced worries regarding the caliber of generic medications in a prior qualitative study carried out in Al Ahsa City (Eastern province).[20]

One of the most essential elements influencing a pharmacist's choice to administer generic versus brand drugs is the patient's physical appearance. Pharmacists working at hospital pharmacies are impacted by medical advice and seek high-quality pharmaceuticals.[21]

Table 1 Characteristics of included studies

Year	First Author	Study Design	Study Participants and Setting	Objectives	Outcome Measured	Main Conclusion/Findings of Study
2018	Yazed S. Alruthia	An exploratory qualitative analysis using stakeholder discussion for data generation was conducted	Stakeholders representing different health care, academic, regulatory, and industrial sectors in Saudi Arabia	To identify the challenges to improve drug supply, and provide recommendations to address them.	The perspectives on the domestic causes of drug shortages in the Kingdom as well recommendations to address this serious health care problem.	Drug shortages are a complex health care issue that involves both international and domestic factors. Although many international factors contributed to drug shortage phenomenon that the Kingdom has been experiencing over the last decade, several domestic factors have played a major role in the recent drug shortage problem. Developing a new regulation that requires pharmaceutical companies, importers, and distributors to notify the SFDA of anticipated drug shortages, overhauling the supply chain management, reforming the procurement policy, establishing and enforcing a new penalty system against law-violating companies, boosting investment in pharmaceutical manufacturing, and revising the current pricing policy of pharmaceutical products.
2021	Al Saffer et al	Survey based Descriptive analysis	The study uses a countrywide Facility Survey that collected data in 2018 from 2319 PHCCs,	To identify challenges and opportunities to scale up PHC capacity, The key objective of the survey was to support stakeholders and policymakers in evidence-based decision-making and developing better-informed annual operational plans.	To generate information on their characteristics, number of health workers, services provided, and capacity elements captured through the Service Availability and Drug Availability constructed indices	Decision-makers need to consider several factors when designing PHC policies. For instance, PHC accreditation needs to be prioritized given its positive correlation with service provision and health workers availability. Finally, there is a substantial need for improvements in e-health.

2016	Mona Alsheikh	An Exploratory Analysis	Data were collected in May-June 2014	To assess explanations for differences in drug shortages reported in the hospital setting in Saudi Arabia (SA) and the United States (US).	Data were collected in May-June 2014 from Brigham and Women's Hospital (BWH) and from 2 Saudi hospitals: King Abdulaziz University Hospital (KAUH) and King Faisal Specialist Hospital and Research Centre (KFSHRC).	The number and characteristics of shortages varied by country and hospital. Several factors, including differences in hospital characteristics, number and type of drugs available, and procurement systems, may explain differences in reported shortages.
2019	Aeshah AlAzmi	A quality improvement process map method was used in this project		The aim is to describe our experience with creating a non-profit voluntary national Medication Exchange and Sharing Network Program (MESNP) throughout the KSA.	Three hundred and fifteen constituted requests for drug supplies due to shortages while the number of reports indicating the availability of overstock drug for re-distribution is 185.	This novel project aims to use our current resources by facilitating the medication exchange and sharing between the organizations at national level. The optimistic goal is to proactively mitigate drug wastages and prevent drug shortages toward better patient care.
2013	Bawazir et al	Cross Sectional Study	Medical managers of health insurance companies.	This study was descriptive in design and used a survey, which was conducted through face-to-face interviews with the medical managers of health insurance companies.		The findings revealed a substantial scope for improvement in terms of pharmaceutical policy standards and regulation in the health insurance companies in KSA. Additionally, the study highlighted such areas to augment the overall quality use of medication, over-prescribing and irrational use of medication.

(*Continued*)

https://doi.org/10.2147/IPRP.S410262

Table 1 (Continued).

Year	First Author	Study Design	Study Participants and Setting	Objectives	Outcome Measured	Main Conclusion/Findings of Study
2020	Hussain Abdulrahman AlOmar	This was a cross-sectional, questionnaire-based study conducted in the period from May to October 2019	Physicians from different practice types and workplace settings. A total of 239 physicians responded to the survey	This study aimed to assess the levels of cost-consciousness and the familiarity with cost concepts among physicians working in Saudi Arabia.		A total of 239 physicians responded to the survey, about 85% of whom had never received any formal education or training in health economics or pharmaco economics. Almost all of them (94%) agreed that physicians need to take a more prominent role in limiting the use of unnecessary medications and three-quarters (75.3%) of them agreed that trying to contain medications cost is the responsibility of every physician.
2020	Hussain Abdulrahman Al-Omar	Qualitative research	This study ascertain how pharmaceutical companies perceive the creation of such a national HTA entity in Saudi Arabia; what they think about it and expect from it			The newly established HTA bodies have been charged with assessing the quality, safety, efficacy, and costs of new drugs compared with all other relevant alternative treatments. Only the most innovative and cost-effective new treatments are now considered for reimbursement. The HTA bodies, however, operate very differently from the traditional drug regulators due to differences in mandates and remits.

2016	F.S. Alkhuzaee	A cross-sectional study	Community pharmacists	To assess the community pharmacists' knowledge, attitude, perception and current practices towards generic medicines substitution in Saudi Arabia.	The perspectives on the current practices towards generic medicines substitution in Saudi Arabia.	The community pharmacists had clear knowledge deficits about generic medicines and their substitution which may partly explain low consumption of generic medicines in Saudi Arabia. Healthcare policy makers need to improve awareness about the safety and efficacy of generic medicines and promote their use in order to cut down cost of medicines and overall healthcare expenditure.
2020	Fadia B. Almahdi	Retrospective quasi-experimental study	All patients with hepatitis C virus (HCV) who were insured by Bupa Arabia, with a direct-acting antivirals	The aim of this study is to evaluate the impact of adopting a pharmaceutical care model on clinical outcomes, patient satisfaction, and cost at a health payer level.	The clinical outcome was the achievement of a sustained virologic response at least 12 weeks from end of treatment. Economic and patients' satisfaction outcomes were included in this study.	A structured pharmaceutical care program for HCV patients can guide the use of specialty medications to achieve optimal clinical outcomes, with lower expenditures and high patients' satisfaction. We can conclude that healthcare insurance can play a key role in managing specialty pharmaceuticals like HCV medications.
2010	Mohammed S. Alsultan	A cross sectional study	A cross-sectional study conducted in 2007, questionnaires distributed to members of the P&T committees in 11 different hospitals in Riyadh, Saudi Arabia.	To assess the trend of using pharmacoeconomic information by Pharmacy and Therapeutics (P&T) committees when making formulary decisions.	To assess the trend of using pharmacoeconomic information	The study showed that pharmacoeconomics can play an important role in the P&T committee formulary decisions. Also, hospitals should recruit health care professionals with pharmacoeconomic expertise to manage limited health resources in the best way available.

(*Continued*)

https://doi.org/10.2147/IPRP.S410262

Table 1 (Continued).

Year	First Author	Study Design	Study Participants and Setting	Objectives	Outcome Measured	Main Conclusion/Findings of Study
2014	Yaser Albadr	A Qualitative study	Twenty community pharmacists (ten hospital affiliated pharmacies and ten non-hospital affiliated pharmacies) were approached using a convenient sampling method.	To explore the factors community pharmacists consider while dispensing branded or generic medicines to consumers.	Consumers' and health care providers' perception and attitude towards generic medicine	Physical appearance of the consumer is revealed to be one of the main factors affecting the pharmacist decision to dispense generic or branded medicine. Pharmacists practicing in hospital affiliated pharmacies were found to be influenced by physicians' recommendation, and prefer to dispense good quality medicines.
2015	Huda O. Salhia	Exploratory qualitative analysis	Physicians was recruited from two hospitals in Riyadh	The current study aimed to explore the knowledge, perception, and attitude of physicians toward generic medicines in Saudi Arabia	To assess health practitioner level of perceived knowledge, opinions and attitudes about local generic medication.	The low market share of local generics medicines attributed to low prescription rates is significantly more among senior-level physicians working in governmental hospitals. Low level of knowledge about generic drugs among physicians was the strongest predictive factor for low prescription.
2016	Yazed Sulaiman Al-Ruthia	Exploratory	The availability of 28 commonly prescribed psychotropic medications checked in community pharmacies in 4 different regions of Saudi Arabia.	The aim of this study was to investigate whether there is a shortage of some commonly prescribed psychotropic medications in community pharmacies.	The availability of psychotropic medications. Potential reasons behind the shortage of some psychotropic medications in community pharmacies were also explored.	The findings of this study should expedite the reform process in both the Ministry of Health and the Saudi Food and Drug Authority (SFDA) to publish and enforce an essential list of medications for retail community pharmacies, which should include the most commonly prescribed psychotropic medications.

2020	Bander Balkhi	Retrospective cross-sectional observational study.	At King Saud University Medical City (KSUMC) for 1 year from January 2016 to December 2016.	The main aim of this study was to assess the utilization pattern of anticancer drugs in breast cancer patients	To assess the utilization pattern of anticancer drugs in breast cancer patients.	FEC was the most common regimen used in this study, consistent with the National Comprehensive Cancer Network (NCCN) guideline recommendation. Our results indicated that adherence to a clinical guideline and recommended medication regimens improved patient outcomes.
2020	Mohammed A. Omair	Qualitative research	A total of 217 participants attended the meeting. The majority were pharmacists (78.8%) physicians (18.9%) and other healthcare providers (2.3%).	Aiming at improving the understanding of these new agents in a diverse interactive conference and to guide stakeholder how to introduce biosimilars into clinical practice.	To guide stakeholders how to introduce biosimilars into clinical practice.	The loss of patentability of many originator biologics has led to the rapid introduction of biosimilar agents. The anticipated economic benefit of introducing such agent has been accompanied by vagueness surrounding their biotechnology, approval requirements, positioning in treatment paradigms and potential for adverse events.
2020	Nora Alkhudair	Qualitative study	A group of experts to discuss key factors impacting the current state of cancer management in Saudi Arabia and to agree on a list of recommendations, with a focus on value-based care, considering evidence, patients, and costs.	To improve cancer patient care and quality of life.		This article outlines recommendations from SHARP pertaining to 4 key domains that impact cancer care: regulatory, procurement, treatment and patient domains. These recommendations were aligned with the Saudi Vision 2030, to optimize cancer management in multi-level Multidisciplinary approach, with a focus on value-based care that places central importance on patient outcomes.

(*Continued*)

https://doi.org/10.2147/IPRP.S410262

Table 1 (Continued).

Year	First Author	Study Design	Study Participants and Setting	Objectives	Outcome Measured	Main Conclusion/Findings of Study
2021	Mona Y. Alsheikh	Community pharmacy staffs from Saudi Arabia	November 2019 to March 2020 among a convenient sample of community pharmacy staffs from Saudi Arabia.	To assess their knowledge, opinion and practice toward drug shortages.	Knowledge, opinion and practice toward drug shortages.	Most community pharmacists are aware of and reported suitable practices regarding drug shortages, but their personal experiences and opinion toward the problem differ according to each pharmacy's policy because there is no standardized program available for reporting shortages.
2021	Hussain A. Al-Omar	Exploratory Study	A diversified group of local experts were invited to a two-day capacity building workshop from 18 to 19 December 2019 in Riyadh, Saudi Arabia.	Capacity building exercises are important to increase understanding of healthcare processes by key stakeholders, and to facilitate open discussions to build consensus	Participants were asked either to "opt out" of its consideration for future HTA assessments, or rate it from 1 to 10 (low–high) on feasibility and acceptability.	Participants valued a pharmaceutical product's efficacy and safety alongside the consideration of disease characteristics for HTA processes. Participants also valued a binding HTA recommendation and the use of local real-world evidence, where available, to support HTA submissions.
2017	Yazed S. AlRuthia	Questionnaire-based cross-sectional study.	Pharmacy departments in secondary and tertiary care hospitals in the city of Riyadh.	To explore the prevalence and characteristics of drug shortages as well as identify strategies to minimize their impact on patient care and safety in large hospitals.	Percentages of drug class shortages, characteristics, and strategies to minimize impact on patient care and safety across each hospital sector.	The relatively high reported rates of drug shortages in some hospitals should encourage health policymakers to address this serious public health problem.

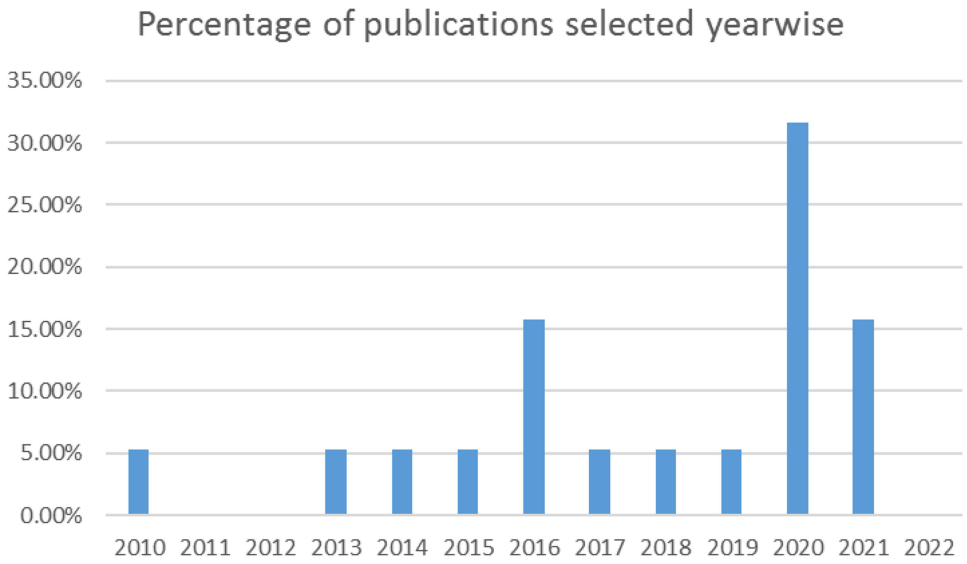

Figure 2 Articles Distribution through the years.

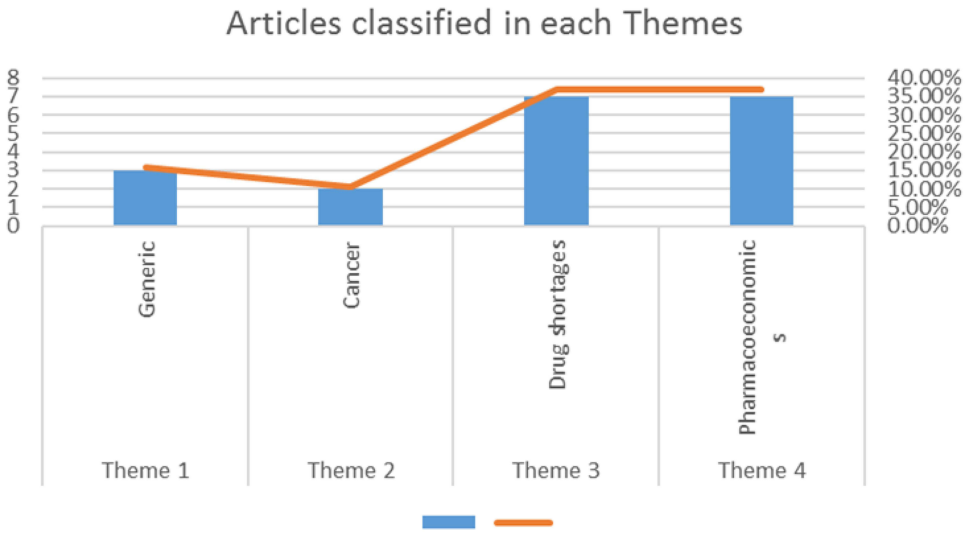

Figure 3 Articles Classified in each Themes.

Theme 2. Access to Medicines

In one of the studies, it was stated that Drug shortages are an area of the complicated healthcare problem, including foreign and local issues. Creating new laws requiring pharmaceutical manufacturers, dealers, and suppliers to intimate the (Saudi Food and Drug Administration) of impending medicines shortages, upgrading the medication distribution chain, updating the policies on delivery systems, developing, and implementing the penalty regulations against law-violating corporations, expanding pharmaceutical manufacturing investment, and altering present policy of pricing the pharmaceuticals.[22]

To explore the occurrence, features, and solutions for reducing the effects of drug shortages on patient care and safety in large hospitals. In Saudi Arabia, a cross-sectional study using questionnaires was carried out. More than 70% of participants cited educating prescribers, suggesting substitute medications, and informing hospital personnel about the existence of drug shortages using modern communication methods as the two most effective strategies for reducing the impact of drug shortages

on patient care. Health policymakers should be prompted to address this significant public health issue by the high reported rates of medicine shortages in some hospitals.[23]

One of the studies, in Saudi Arabia stated that pharmacies in remote locations are less likely to have specific prescriptions accessible across the board. Although most pharmaceuticals were provided in both cities and suburban regions, with availability varying between 50% to 100%, the availability of the same medicine in both areas was less than 12%.[24]

Important domestic factors highlighted for drug shortages include lack of government legislation requiring early notice of drug shortages, inefficient pharmaceutical distribution system, low-profit margins on certain vital pharmaceuticals, government contracting strategy that is out of step with pharmaceutical industry developments, overdependence on the pharmaceutical business, ineffectual legal punishment imposed on pharmaceutical firms, and various authorized pharmaceutical importers and dealers.[24] A study carried out in Saudi Arabia sought to determine whether there is a scarcity of several frequently prescribed psychiatric drugs in Saudi Arabian community pharmacies, and if so, to evaluate the potential causes of the shortage of these drugs. Most psychotropics were unavailable in almost 50% of the 248 private pharmacies assessed. The study's findings should hasten the Saudi Food and Drug Administration's (SFDA) structural transformation process, which should lead to the publication and enforcement of a required list of drugs for community pharmacies that includes the most frequently prescribed psychotropic medications.[25]

The total drug shortage in US hospitals (15.1%) was higher than in Saudi hospitals (10.3%).[26]

In another study, it was found that most community pharmacists are informed of and have confirmed appropriate procedures addressing prescription shortages. However, their individual experiences and perspectives on the issue varied depending on the pharmacy's practice since there is no defined mechanism for notifying medicine shortages.[27]

In one of the studies in Saudi Arabia, Three hundred fifteen medicines were requested due to drug shortage, which indicated that excess pharmaceuticals were available for re-issue. Overstored medicines reports were re-issued in over 98% of cases, covering 75% of medicine shortage requests.[27]

In Saudi Arabia, a different study found that due to the absence of any clearly defined methodology to report any drug shortage. Most pharmacists in the community pharmacy know the proper techniques for dealing with medication shortages. However, their experience and perspectives on the issue vary depending on each pharmacy's policies.[28]

Theme 3. Pharmacoeconomics

In order to determine the level of cost consciousness and knowledge with cost ideas among Saudi Arabian doctors, a cross-sectional, questionnaire-based study with a study period from May to October 2019 was conducted. It includes Physicians who were employed in Saudi Arabia in a variety of settings and workplaces.

The physicians concurred that while prescribing medicines, expenses should be taken into account. However, physicians are not excessively certain of their understanding of healthcare expenses. The most frequent obstacles to taking cost into account in a physician's therapeutic decision-making in their everyday practice were thought to be things like medical ethics, patient demand, and satisfaction. The concept of cost-effectiveness increased cost consciousness.[29]

The KSA is undergoing a significant shift in healthcare delivery to achieve its nationwide "Project 2030".[30] The Kingdom is establishing autonomous, scientific-proof healthcare technology evaluation (HTA) organizations to maximize health gains via optimal resource use. Exercises to build capacity are crucial to ensuring that key stakeholders have a better understanding of healthcare procedures and to facilitating open dialogue that leads to agreement. On December 18 and 19, 2019, Riyadh, Saudi Arabia hosted a two-day workshop to build capacity for a diverse group of local specialists. The study investigated the opinions of a multi-stakeholder group of regional Saudi experts on the value components that may be significant for health technology assessment (HTA) procedures and methodologies pertaining to pharmaceutical products in Saudi Arabia (referred to as "value drivers"). The goal of this study was to find out what pharmaceutical businesses visualize developing a comprehensive HTA organization in KSA and the companies' expectations. The conference's outcomes were divided into three categories: HTA methodology, goal and mission, application, and social concerns. HTA's contribution to the Saudi healthcare system was primarily praised, and industry participants desired to adjust to the country's future needs.[30]

In addition to taking disease factors into account for HTA processes, participants valued a pharmaceutical product's efficacy and safety. Participants also valued a binding HTA recommendation and the utilization of local real-world data to back up HTA contributions when this was possible.

The two factors that most strongly influenced acceptability and feasibility were effectiveness and safety. The least acceptable and feasible were explicit cost-effectiveness thresholds. Participants identified data accuracy and availability as two major barriers to HTA implementation in Saudi Arabia. Stakeholders prioritized the effectiveness and safety of pharmaceutical products and illness characteristics in HTA procedures. They also valued a legally binding healthcare technology assessment suggestion and, where possible, the inclusion of domestic proof to back up HTA recommendations.[31]

The P&T committee members of 11 different hospitals in Riyadh, Saudi Arabia, were issued structured survey questions as part of another study that was carried out in 2007.

The study demonstrated the potential influence of pharmacoeconomics on Pharmacy and Therapeutic panel formulary determinations. To facilitate the use of such a tool, more training should be provided to medical practitioners and hospital management. To make the most use of limited healthcare resources, hospitals need to recruit healthcare personnel with pharmacoeconomic expertise.[32]

The study's findings stated that the fast emergence of biosimilar medicines has resulted from the loss of product patents and several original biologics. The anticipated economic benefit of launching such a drug accompanies uncertainties regarding its biotechnology, authorizations, position in therapeutic regimens and the possibility of side consequences.[33]

A coordinated medication management strategy for HIV patients helps control the use of specialist drugs to achieve the most remarkable health outcomes while saving costs and boosting patient satisfaction. So, medical coverage can play a significant part in developing specialized medicines such as HCV drugs.[34]

The study's findings indicated much scope for development in the areas of medication policy guidelines in Saudi Arabia's medical insurance businesses. Furthermore, the Research concentrated on improving pharmaceutical services, such as unnecessary prescription of drugs and illogical use of medication.[35]

Theme 4. Cancer Drugs Financing

In a study conducted in Saudi Arabia, it was found that for the treatment of Breast Cancer, FEC (fluorouracil, epirubicin, and cyclophosphamide) was the most often utilized regimen.[36] Which aligns with the National Comprehensive Cancer Network (NCCN) guidelines. According to the findings, compliance with a medical standard and recommended pharmaceutical treatments resulted in better cancer care. The findings show how studying drug usage patterns may help institutions manage inventories and use healthcare resources more efficiently.[36] Saudi Oncology Health Economics Expert Group (SHARP) suggested four important categories that affect healthcare outcomes: legal, supply, therapeutic, and consumer areas.[37]

Discussion

On a national scale, the availability of necessary and inexpensive medicines is a critical component of any healthcare system. Saudi Arabia provides free health care to its citizens, yet, the present literature indicates a substantial medicine shortage.

Pharmacoeconomics

Almost 36.84% of the included articles were classified as pharmacoeconomic studies. According to one of the studies, pharmaceutical expenses are the area of healthcare spending that is growing the fastest in the majority of the countries, thus physicians must conduct drug prescribing with cost considerations in mind. Pharmaceuticals can only be sold if the Saudi government approves the pricing via the (Saudi Food and Drug Administration),[38] which is a dynamic process since the government is fully engaged in providing extensive medical care to the citizens.[38] Cost varies caused of unforeseen circumstances that affect other parts of the world; however, as an incentive, the government can ensure price stability for items whose manufacturing plants have been shifted to Saudi Arabia. Because of the population's higher earning power and the government-funded free health services system, pharmaceutical pricing variations appear to have little or no impact in Saudi Arabia.[38]

Generic Medicines

Almost 15.78% of the included articles were classified as Generic medicines studies. Healthcare facilities (private and government) look to adopt generic drugs, resulting in a larger market for them. However, because of their capacity to get branded items, the Saudi public will be hesitant to embrace this transformation. To reduce the price of medications and total healthcare spending, healthcare officials must increase public awareness of the safety and effectiveness of generic medications and encourage their usage. To encourage private industry participation in medicine manufacturing and marketing, the government provides a range of incentives.[38] It was investigated in a study by Hassali et al[39] how generic medications were used in the health systems of eight different countries, including Australia. According to the survey, generic medications are between 20% and 90% less expensive than their originator counterparts. Patients typically turn to neighborhood pharmacists as their first port of call for convenient access and quick relief from their ailments.[40] Nine European nations have indicated that the accessibility of medications is impacted by reclassification in community pharmacies since there was an uptick in pharmacy establishment following deregulation.[41] However, this study also pointed out that this frequently occurred in cities. Therefore, authorities in Australia and New Zealand should also take into account fair access, as suggested by Vogler et al, even though reclassification may improve access.[41] If well-balanced, pharmaceutical policies can influence price levels and the accessibility of branded and generic medications. The Kingdom of Saudi Arabia focuses entirely on cost-cutting supply-side strategies rather than demand-side initiatives.[41]

Cancer Drugs Financing

Almost 2% of the included articles were classified as Cancer Drugs Funding studies. According to a study by Zia et al[42] the Qataris do not have to pay for healthcare; it is provided at no cost to them. However, the government always foots 80% of the expense for expatriates. Even for people with chronic illnesses like cancer, diabetes, and heart disease, they only pay 20% of the cost.

These nations should prioritize government procurement and price rules to achieve the industrialization and healthcare systems' productivity and accessibility goals. To enhance generic acceptance, countries should develop, apply, and execute guidelines for utilizing generic medication.[43] Given the region's inherent distrust of generics, procurement regulations concentrating on costs and compensation could be incapable of achieving performance and cost goals. Such change should be accompanied by identifying the market policies on generic medicines and alternatives and regulatory capacity strengthening if necessary.[43]

Access to Medicines

Almost 36.84% of the included articles were classified as Access to medicines studies. In compared to the United States, Australia, and New Zealand, it has been discovered that the United Kingdom funds a greater number of medications, the most recent medications, and innovative medications. In contrast to other European nations, the UK takes longer to reimburse for new medications, and access to different types of medications varies across the country.[44] Even if there is a need to increase investment, prioritizing is also necessary to guarantee timely access to new medications for patients in the United Kingdom.[44]

When Japan was contrasted with European nations, notably the United Kingdom. In Japan, there is more insurance coverage and access to more medications.[45]

Local pharmaceutical manufacture is essential for ensuring that national healthcare systems remain resilient, particularly when it comes to improving access to necessary medications and reducing reliance on imports and global supply chains. Pharmaceuticals are a research-intensive industry, and one of the biggest obstacles to diversifying the portfolio of locally produced pharmaceuticals is the systemic lack of governance and support for R&D activities in this sector, among a host of related problems like unsupportive regulatory regimes and human resources capacity limitations.[46]

The task of conducting a scoping review familiarizes with existing scenarios in Saudi Arabia regarding drug access and availability. However, there is a lot to be done for dispensing generic medicines to reduce the existing cost of pharmaceuticals. To enhance generic acceptance, Saudi Arabia should develop, adopt, and execute generic pharmaceutical ordering and supply rules. Saudi Arabia's government has done a lot to decrease drug shortages. The health authorities should provide proper warehouses and suppliers to reduce the delays of drugs that are still inadequate and

unsatisfactory compared to the developed world. According to the scoping review, more studies are needed to establish the effect of these challenges on the country's healthcare facilities, patients, physicians, and economy.

Conclusion

All the studies were conducted in Saudi Arabia. The prominent themes were Generic medicine, Drug Availability and Shortages, Pharmacoeconomics, and Cancer drugs financing. Finally, the available evidence revealed that Saudi Arabia's healthcare system has numerous issues ranging from cancer drug financing, medicines shortages, and access issues to pharmaceuticals. Stakeholders and governments should pay close attention to these issues and support any attempts to alleviate their impact. Furthermore, more teaching programs and resources are needed to raise patient and physician awareness of unethical non-prescribed drug administration, drug abuse, or misuse. To avoid medicine delays, health authorities should supply adequate warehouses and suppliers. More Research is needed to see how these difficulties affect the healthcare system, patients, providers, and the economy.

Data Sharing Statement

The article contains all pertinent data. The corresponding author has access to the whole database of retrieved papers as well as the full search history.

Ethics Approval and Consent to Participate

Not applicable as the study methodology is a scoping review for published materials.

Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

Funding

There is no funding to report.

Disclosure

The authors claim to have no conflicts of interest.

References

1. The National Medicines Policy. A partnership for better health outcomes. National Medicines Policy Document; 2014.
2. Almarsdottir AB, Traulsen JM. Studying and evaluating pharmaceutical policy becoming a part of the policy and consultative process. *Pharm World Sci*. 2006;28:6–12. doi:10.1007/s11096-006-9011-0
3. Mossialos E, Oliver A. An overview of pharmaceutical policy in four countries: France, Germany, The Netherlands and the United Kingdom. *Int J Health Plann Manag*. 2005;20:291–306. doi:10.1002/hpm.816
4. Wonder M, Milne R. Access to new medicines in New Zealand compared to Australia. *N Med J*. 2011;124:12–28.
5. GMI Blogger. Saudi Arabia population statistics 2023 [Infographics]; 2023. Available from: https://www.globalmediainsight.com/blog/saudi-arabia-population-statistics/. Accessed June 12, 2022.
6. Ahmed M. Healthcare opportunities and challenges in Saudi Arabia 2020; 2021. Available from: https://insights.omnia-health.com/reports/healthcare-opportunities-and-challenges-saudi-arabia. Accessed July 5, 2023.
7. Almalki M, FitzGerald G, Clark M. Health care system in Saudi Arabia: an overview. *EMHJ*. 2011;17(10):784–793. doi:10.26719/2011.17.10.784
8. Organizations' USDoCot. Healthcare resource guide. Saudi Arabia; 2019.
9. Almutairi KM. Culture and language differences as a barrier to provision of quality care by the health workforce in Saudi Arabia. *Saudi Med J*. 2015;36(4):425. doi:10.15537/smj.2015.4.10133
10. Center R. Drug shortages in Saudi Arabia: root causes and recommendations; 2018.
11. AlTamimi A, Malhis NK, Khojah NM, Manea SA, AlTamimi A, AlShammary SA. Antidote availability in Saudi Arabia hospitals in the Riyadh Province. *Basic Clin Pharmacol Toxicol*. 2018;122(2):288–292. doi:10.1111/bcpt.12897
12. Almaghaslah D, Alsayari A, Asiri R, Albugami N. Pharmacy workforce in Saudi Arabia: challenges and opportunities: a cross-sectional study. *Int J Health Plann Manage*. 2019;34(1):e583–e93. doi:10.1002/hpm.2674

13. Almaghaslah D, Alsayari A, Almaghaslah S, Alsanna H. Patients' satisfaction with E-Prescribing (Wasfaty) in Saudi Arabia: a survey of country-level implementation. *InHealthcare*. 2022;10(5):806. doi:10.3390/healthcare10050806
14. Morrow NC, LeCates RF, Zhang F, Ross-Degnan D. Pharmaceutical policy Part 1 The challenge to pharmacists to engage in policy development. *J Pharm Policy Pract*. 2015;8(1):1–5. doi:10.1186/s40545-014-0024-0
15. Rasooldeen M. Saudi Arabia aims to boost pharmaceutical industry. Arab News (Jeddah, Saudi Arabia); 2017.
16. export.gov. Saudi Arabia - pharma and biosciences 2020; 2020. Available from: https://www.export.gov/apex/article2?id=Saudi-Arabia-Pharma-and-Biosciences. Accessed July 5, 2023.
17. Administration it. Saudi Arabia - country commercial guide 2019; 2019. Available from: https://www.trade.gov/knowledge-product/saudi-arabia-pharma-and-biosciences. Accessed July 5, 2023.
18. Tricco AC, Lillie E, Zarin W, et al. PRISMA extension for scoping reviews (PRISMA-ScR): checklist and explanation. *Ann Intern Med*. 2018;169(7):467–473. doi:10.7326/M18-0850
19. Penchansky R, Thomas JW. The concept of access: definition and relationship to consumer satisfaction. *Med Care*. 1981;19:127–140. doi:10.1097/00005650-198102000-00001
20. Alkhuzaee FS, Almalki HM, Attar AY, et al. Evaluating community pharmacists' perspectives and practices concerning generic medicines substitution in Saudi Arabia: a cross-sectional study. *Health Policy (New York)*. 2016;120(12):1412–1419. doi:10.1016/j.healthpol.2016.09.018
21. Salhia HO, Ali A, Rezk NL, El Metwally A. Perception and attitude of physicians toward local generic medicines in Saudi Arabia: a questionnaire-based study. *Saudi Pharmaceut J*. 2015;23(4):397–404. doi:10.1016/j.jsps.2015.01.014
22. Alruthia YS, Alwhaibi M, Alotaibi MF, et al. Drug shortages in Saudi Arabia: root causes and recommendations. *Saudi Pharmaceut J*. 2018;26(7):947–951. doi:10.1016/j.jsps.2018.05.002
23. AlRuthia YS, AlKofide H, AlAjmi R, et al. Drug shortages in large hospitals in Riyadh: a cross-sectional study. *Ann Saudi Med*. 2017;37(5):375–385. doi:10.5144/0256-4947.2017.375
24. Al Saffer Q, Al-Ghaith T, Alshehri A, et al. The capacity of primary health care facilities in Saudi Arabia: infrastructure, services, drug availability, and human resources. *BMC Health Serv Res*. 2021;21(1):1–15. doi:10.1186/s12913-021-06355-x
25. Al-Ruthia YS, Mansy W, Barasin M, et al. Shortage of psychotropic medications in community pharmacies in Saudi Arabia: causes and solutions. *Saudi Pharmaceut J*. 2017;25(5):744–749. doi:10.1016/j.jsps.2016.10.013
26. Alsheikh M, Seoane-Vazquez E, Rittenhouse B, Fox ER, Fanikos J. A comparison of drug shortages in the hospital setting in the United States and Saudi Arabia: an exploratory analysis. *Hosp Pharm*. 2016;51(5):370–375. doi:10.1310/hpj5105-370
27. AlAzmi A, AlRashidi F. Medication Exchange and Sharing Network Program (MESNP) initiative to cope with drug shortages in the Kingdom of Saudi Arabia (KSA). *Risk Manag Healthc Policy*. 2019;12:115. doi:10.2147/RMHP.S198375
28. Alsheikh MY, Alzahrani MA, Alsharif NA, et al. Community pharmacy staff knowledge, opinion and practice toward drug shortages in Saudi Arabia. *Saudi Pharmaceut J*. 2021;29:1383–1391. doi:10.1016/j.jsps.2021.09.001
29. Al-Omar HA. Cost-conscious medications-prescribing behavior among physicians working in Saudi Arabia. *Arch Pharm Pract*. 2020;1:143.
30. Al-Omar HA, Attuwaijri AA, Aljuffali IA. What local experts expect from a health technology assessment (HTA) entity in Saudi Arabia: workshop conclusions. *Expert Rev Pharmacoecon Outcomes Res*. 2020;20(1):99–104. doi:10.1080/14737167.2019.1610398
31. Al-Omar HA, Aljuffali IA, Solà-Morales O. Value drivers for pharmaceutical products in health technology assessment (HTA) in Saudi Arabia: results from a capacity building, multi-stakeholder workshop. *Saudi Pharmaceut J*. 2021;29(9):946–954. doi:10.1016/j.jsps.2021.08.001
32. Alsultan MS. The role of pharmacoeconomics in formulary decision making in different hospitals in Riyadh, Saudi Arabia. *Saudi Pharmaceut J*. 2011;19(1):51–56. doi:10.1016/j.jsps.2010.10.005
33. Omair MA, Alhawassi T, Alwaihibi M, et al. Improving the understanding of originator and biosimilar biologics among healthcare providers in Saudi Arabia. *Saudi Pharmaceut J*. 2020;28(12):1827–1829. doi:10.1016/j.jsps.2020.11.008
34. Almahdi FB, Hashim AH, Albaba EAM, et al. The Impact of the pharmaceutical care management model of Hepatitis C medications on the cost at health insurance level. *Value Health Reg Issues*. 2020;21:230–237. doi:10.1016/j.vhri.2020.01.004
35. Bawazir SA, Alkudsi MA, Al Humaidan AS, Al Jaser MA, Sasich LD. Pharmaceutical policies used by private health insurance companies in Saudi Arabia. *Saudi Pharmaceut J*. 2013;21(3):267–276. doi:10.1016/j.jsps.2012.10.005
36. Balkhi B, Alqahtani S, Altayyar W, et al. Drug utilization and expenditure of anticancer drugs for breast cancer. *Saudi Pharmaceut J*. 2020;28(6):669–674. doi:10.1016/j.jsps.2020.04.007
37. Alkhudair N, Alshamrani M, Samarkandi H, et al. Cancer management in Saudi Arabia: recommendations by the Saudi Oncology Health Economics Expert Group (SHARP). *Saudi Pharmaceut J*. 2021;29(2):115–120. doi:10.1016/j.jsps.2020.12.005
38. Khan TM, Emeka P, Suleiman AK, Alnutafy FS, Aljadhey H. Pharmaceutical pricing policies and procedures in Saudi Arabia: a narrative review. *Ther Innov Regul Sci*. 2016;50(2):236–240. doi:10.1177/2168479015609648
39. Hassali MA, AlRasheedy AA, Mclachlan A, et al. The experiences of implementing generic medicine policy in eight countries: a review and recommendations for a successful promotion of generic medicine use. *Saudi Pharmaceut J*. 2014;22:491–503. doi:10.1016/j.jsps.2013.12.017
40. Kurdi S, Faran A, Eareeni E, et al. Assessment of knowledge and attitude toward the new antibiotic dispensing law and its effect on antibiotic use in Saudi Arabia. *Saudi Pharmaceut J*. 2020;28(1):58–67. doi:10.1016/j.jsps.2019.11.005
41. Vogler S, Kilpatrick K, Babar Z-U-D. Analysis of medicine prices in New Zealand and 16 European countries. *Value Health*. 2015;18:484–492. doi:10.1016/j.jval.2015.01.003
42. Zia N, Ibrahim MI, Adheir F, Babar Z-U-D. Identifying priority medicines policy issues for Qatar: exploring perspectives and experiences of healthcare professionals through a qualitative study. *BMJ open*. 2021;11(11):e054150. doi:10.1136/bmjopen-2021-054150
43. Kamphuis BW, Kanavos P. Assessing pricing and reimbursement policies for generic pharmaceuticals in the MENA region for improved efficiency, affordability and generic penetration. *Health Policy OPEN*. 2021;2:100045. doi:10.1016/j.hpopen.2021.100045
44. ABPI. Why is it important to improve access to medicine in the UK?; 2019 Available from: https://www.abpi.org.uk/what-we-do/medicine-pricing-in-The-uk/why-is-it-important-to-improve-access-to-medicine-inthe-uk/. Accessed July 5, 2023.
45. Takayama A, Narukawa M. Comparison of new drug accessibility and price between Japan and major European countries. *Ther Innov Regul Sci*. 2017;51:604–611. doi:10.1177/2168479017706716
46. Tawfik EA, Tawfik AF, Alajmi AM, et al. Localizing pharmaceuticals manufacturing and its impact on drug security in Saudi Arabia. *Saudi Pharmaceut J*. 2021;2021:1.