



Literature review: impacts of e-catalog policy on drug procurement in the JKN (national health insurance) era

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Abstract

Background: The influence of the e-catalog policy on medication procurement during the National Health Insurance (JKN) era encompasses critical elements such as the necessity to enhance efficiency, accountability, and transparency within the system. All medical facilities working with BPJS Kesehatan are expected to use the e-purchasing application to purchase drugs in the JKN era.

Objective: The focus of this literature review was to present empirical evidence about the influence of the e-catalog strategy on the procurement of pharmaceuticals by healthcare institutions during the JKN era.

Method: This literature review involved searching for several papers published online via PubMed and Google Scholar using keywords and MeSH terms. The search terms included BPJS e-purchasing, JKN e-purchasing, referral e-purchasing, JKN e-catalog, BPJS, and insurance e-catalog.

Result: The e-catalog policy seeks to establish a more equal, efficient, and responsible pharmaceutical procurement system. This aligns with JKN's objective of maximizing resource utilization to enhance the overall quality of healthcare. The execution of the e-catalog policy is an essential measure in modernizing and enhancing the medication procurement system in the JKN era. Consequently, the e-catalog policy is anticipated to yield substantial enhancements in pharmaceutical management and the execution of the JKN program.

Conclusion: The e-catalog technique possesses the capacity to markedly enhance drug procurement in the JKN era by augmenting efficiency, accountability, and transparency. System updates will necessitate concentrated efforts.

Keywords: impact, procurement, e-purchasing, e-catalog, JKN

1. Introduction

In healthcare systems such as Indonesia's National Health Insurance (JKN), the procurement of pharmaceuticals constitutes a pivotal component. Beyond the fundamental objective of ensuring health facilities are well-equipped with essential medications, this process also contributes to enhancing the effectiveness and efficiency of health budget allocation. In light of technological advancements, initiatives aimed at enhancing the efficiency, transparency, and effectiveness of drug procurement have become imperative (Kemenkes RI, 2014).

In the digital era, the implementation of the e-catalog strategy constitutes a substantial innovation in drug procurement reform. The e-catalog is an IT-based system that provides a digital platform for tracking and recording transactions related to online drug purchases. This strategy is expected to address common problems in drug procurement, including inefficiency, lack of transparency, and the potential for corruption (Kusmini *et al.*, 2016).

The JKN e-catalog policy intends to simplify the procurement procedure by integrating information related to drug prices, specifications, and suppliers in one centralized platform. The e-catalog is expected to make the procurement process faster, more transparent and accountable. This



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is conformable with JKN objective of ensuring the effective management of healthcare investments and the provisions of essential medications to patients (Kemenkes RI, 2014).

Nevertheless, the implementation of the e-catalog presents numerous challenges. A multitude of obstacles must be surmounted prior to the implementation of this strategy, including the necessity of user training, process adaptation, and the modification of electronic infrastructure to align with regional constraints. Therefore, it is important to evaluate the influence of the JKN e-catalog policy on medicines purchasing process, including the benefits and challenges it faces (Widhi, 2023).

The enforcement of e-catalog has been demonstrated to enhance the efficiency and transparency of the purchasing process. A direct impact of e-catalog on the management of chronic disease has also been observed. By facilitating quick and accurate access to information on drug prices and availability, e-catalog enables health facilities to manage long term medications required for patients with chronic diseases more effectively. This is prominent as patients with chronic conditions frequently require large amounts of medication on regular basis, so an e-catalog system can help ensure continuity of their treatment and minimize the risk of therapy interruption (Saputra *et al.*, 2019).

Chronic disease is the cause of death in 36 million people in the world or equivalent to 36% of the number of deaths globally. According to data from the Riskedas in 2013, chronic disease was one of the main causes of death in Indonesian. In 2014 the BPJS Kesehatan implemented the Chronic Disease Manajemen Programme (Prolanis) and The Reverse Referral Programme (PRB) to JKN-KIS programme participants with chronic disease (Kemenkes RI, 2014; Rosdiana *et al.*, 2017).

Prolanis is a health service for patient with chronic disease with stable conditions. The Reverse Referral Programme (PRB) is a flagship programme of BPJS Kesehatan, which aims to improve the quality and access of health services for participants with chronic disease. This programme is intended for participants with 9 (nine) disease with stable (controlled) conditions, but these patients still require long term treatment. The chronic diseases included in the Reverse Referral Programme are epilepsy, heart disease, asthma, hypertention, chronic obstructive pulmonary disease (COPD), diabetes mellitus, stroke, schizophrenia, and systemic lupus erythematosus (SLE) (BPJS Kesehatan, 2014).

Participants of PRB can obtain drugs at pharmacies or pharmaceutical installations of BPJS Health Providers. The high level of drug services for participants in the Reverse Referral Program every month increases the number of requests for drugs at related health facilities and causes drug shortage. The drug stockout problem in pharmacies pharmaceutical installations is closely related to

drug management. Drug management is an activity that includes planning, procurement, receipt, storage, control, distribution, and drug disposal (Lanathasya, 2015).

In addition to manage the catalog system, monitoring and evaluating the implementation of e-catalog and e-purchasing have become the task of LKPP (Government Goods/Services Procurement Policy Agency). E-catalog is an electronic information system from various drug providers that include lists, type, technical specifications, and drug prices. The information of product provider and prices posted thru the e-catalog are accessed by non-providers through the website Electronic Procurement Agency (LPSE). The e-procurement system implementation for the JKN is expected to accelerate drug procurement and purchase. To help health facilities get cheaper medicines, the government created a drug catalog on the e-catalog platform under the Services Procurement Policy Agency (LKPP), with pharmaceutical companies submitting competitive drug price offers (Agustini *et al.*, 2022).

The implementation of an e-catalog system is intended to enhance the efficiency, effectiveness, and transparency of the drug procurement process. The objective of e-purchasing is to streamline the process of accountable drug procurement. However, its implementation has been observed to impose additional burdens and act as an obstacle to drug supply efforts. The inability to supply drugs by the pharmaceutical industry is the biggest obstacle of the procurement of non-compliant drugs due to drug supplies constraints in the pharmaceutical installation. The occurrence of medicines stockout in health facilities is an impact of e-purchasing practice. The implementation of e-purchasing for drug procurement carries certain risks, including the possibility of drug shortages and the potential inefficiencies of the drug procurement budget if not implemented effectively (Kusmini *et al.*, 2016).

Based on the abovementioned background, the objective of this study was to assess the impact of the e-catalog implementation on drug procurement in the JKN era, focusing on how this system affects efficiency, transparency, and accountability in the procurement process. In addition, this article also discusses the challenges faced in the implementation of e-catalog and provides recommendations to improve the effectiveness of this policy in supporting the JKN program.

2. Method

2.1. Sample preparation

In this research, the author reviewed various publication articles available online through Pubmed and Google Scholar using keywords and MeSH terms. The keywords used in the search were BPJS e-Purchasing, JKN e-Purchasing, e-Purchasing Referral, JKN e-catalog, BPJS, Insurance e-catalog

and relevant keywords. The inclusion criteria applied in this literature review were as follows: national and international publication articles, articles in Indonesian and English, published from 2014 to 2022, articles can answer the research questions. While, following exclusion criteria were employed in the article selection process including not a full-text paper, the article were published before 2014, and article of the same study.

2.2. Data analysis

The PRISMA flow diagram used in this literature review is presented below:

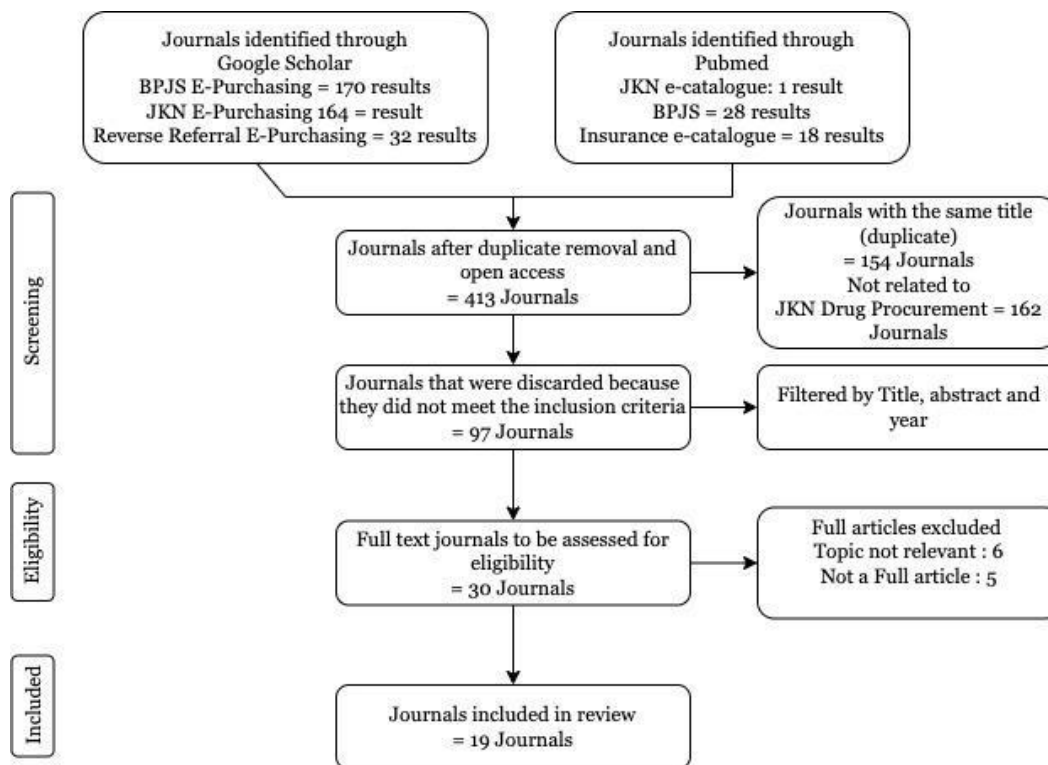


Figure 1. Flow chart for articles selection

3. Result and discussion

A literature study consists of several stages that must be carried out, to guarantee the credibility of the results. In this study, the first stage was to search for data, through Google Scholar and PubMed using relevant keywords. The data collected were screened or selected according to the topic, i.e., drug procurement in the JKN era. The next stage was to assess the data sources to determine whether the data were eligible for further analysis. The data analyzed were then grouped and presented to answer the problems formulated at the beginning to draw conclusions.

In 2014, the government established the JKN program in accordance with Law No. 40/2004 concerning the National Social Security System (SJSN). The features of JKN program were

implementing the principles of quality control and cost control (KMKB); ensuring that drugs are of quality and cost effective; considering the rational use of drugs. The government in this case determines the list and price of drugs to provide services for the National Health Insurance Program, the National Formulary (FORNAS), and applications to facilitate the mechanism of drug procurement through e-catalog, namely procurement through the website of the Electronic Procurement Agency (LPSE) (Kemenkes RI, 2014).

In the pharmaceutical industry related to National Health Insurance drugs, the government acts as a policy regulator. In the pharmaceutical sector, regulation is also determined by the government because the pharmaceutical sector has two orientations, namely business and social orientation. The challenge of the pharmaceutical industry sector is related to medicine raw materials, where 96% of the medicine raw materials in Indonesia must be imported (Ditjen Falmakes, 2016). There has been no solution to such challenge because the number of human resources who are experts and qualified in producing drug raw materials is limited (Ditjen Farmalkes, 2016).

Policies related to the flow of drug management start from the national drug policy, taking into account accessibility, affordability, and the rational use of drugs. From the study results, drug management policies are closely associated with the availability of INA CBGs drugs. Government policy towards the use of drugs in healthcare facilities can be done by ensuring the availability of drugs in all Health Facilities (Raharni *et al.*, 2018).

In the implementation of drug procurement in almost all health facilities, related to JKN drugs, there are several internal and external obstacles. The internal obstacles include the preparation RKO by health facilities not in accordance with the needs, the allocation of inappropriate funds, and delayed payment for previous drug procurement to providers. Meanwhile, the external obstacles include the fact that the drug procurement system through e-purchasing has not been well-socialized, so only a limited number of human resources can process drug procurement through the system; some drugs are not displayed in the e-catalog and some drugs cannot be provided by providers, causing drug stockout; there is no information regarding the availability of drug stocks in the E-catalog (Kemenkes RI, 2014).

Table 1. Selected studies for the literature review

No	Author, year	Title	Research method	Research location	Conclusion	E-purchasing problems	Notes
1	Anggraini <i>et al.</i> , 2020	The Impact of Pharmaceutical Policies on Medicine Procurement Pricing in Indonesia Under the Implementation of Indonesia's Social Health Insurance System	Retrospective observational study; Wilcoxon-Test	The data price of procurement were collected from public and private hospital in Jakarta and Banten	The implementation of pharmaceutical policies under the National Health Insurance (JKN) scheme has been found to significantly impact drug procurement prices in Indonesia, affecting both medications listed in the e-catalog and those not included.	Some medicines listed in the National Formulary were not available in the e-catalog. This situation led health facilities to purchase non-e-catalog medicine to meet patient needs. In addition, the national medicines requirement planning (RKO) was lower than the actual demand, resulting in medicine shortages at several health facilities due to the inability of suppliers to fulfill the required quantities.	This study limitation was conducted in only two hospitals, which might not be representative of all hospitals in Indonesia. Moreover, the research method could be enhanced by incorporating a comparative analysis between the procurement prices of public regional hospitals and private hospitals.
2	Safitri <i>et al.</i> , 2022	An overview of availability of drug with e-purchasing for "pasien program rujuk balik" at Wonosari Pharmacy in December 2020	This study utilized a descriptive observational approach with retrospective data collection	Wonosari Pharmacy	The availability of medicines in pharmacies was insufficient to meet PRB's needs. Most medicine shortages were attributed to stock depletion at the distributor level. Pharmacies borrowed medicines from other Kimia Farma branches or reduced the quantity issued to each patient in order to accommodate the	NA	The obstacles of e-purchasing were some medicine not listed in the e-catalog, long waiting times, and medicine stockouts.

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					needs of all patients. An important finding was that hypertensive patients constitute the demographic group most frequently affected by these shortages.		
3	Syamsul <i>et al.</i> , 2021	Evaluation of Drug Procurement with the E-Purchasing System on the Availability of Drugs at the Pharmacy Installation of the Central Aceh Regency Health Office	An observational research was conducted through case studies, utilizing purposive sampling and qualitative data analysis	Pharmacy Installation of the Central Aceh Regency Health Office	This study revealed that the availability of pharmaceuticals at the District Pharmacy Installation was not optimal. It was because of the national medicine shortages, and the information system did not support minimum stock input. The procurement process of drugs is governed by PMK No. 63 of 2014; however, the utilization of e-purchasing for this purpose is deemed inadequate.	NA	NA
4	Veronica <i>et al.</i> , 2019	Management of Prolanis Medicines for BPJS Health Patients at Sana Farma Pharmacy Makassar in the 2018-2019 period	Descriptive qualitative method; data were collected through interviews and observations	Sana Farma Pharmacy, Makassar	The drug management of Prolanis at Sana Farma Pharmacy in Makassar complied with Standard Operational Procedure (SOP). The quantity and types of drugs planned for 2018-2019 remained consistent.	Drug procurement depended on the payment agreement with BPJS, so some patients did not get the medicines they needed. In case of medicine shortages, negotiation with wholesalers was	NA

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					Procurement was conducted through the e-catalog system. If a medicine was not listed in the e-catalog, the pharmacists would purchase it directly from a distributor. Drug supervision was implemented through systematic prescription verification and the disposal of expired or unused medication by applicable regulations.	necessary to obtain affordable prices.	
5	Satibi <i>et al.</i> , 2020	The Influence of Doctors And Patients' Perception On The Drugs Availability In The Hospital During The Era Of National Health Insurance	Descriptive and qualitative method	Academic Hospital of Gadjah Mada University	The availability of pharmaceutical drugs was influenced by various factors, including production planning, production capacity, and the procurement of raw materials. Pharmaceutical companies' ability to ensure drug availability was contingent on accurate production planning, adequate production capacity, and the procurement of raw materials. However, the accuracy of the RKO (Drug Requirement Plan), which served as the	In the context of the JKN (National Health Coverage) era in Indonesia, the issue of drug availability persists as a salient concern. The pharmaceutical industry plays a pivotal role in addressing this issue by implementing effective supply chain management strategies.	NA

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					<p>foundation for drug procurement in the e-catalog, was often compromised. This inaccuracy hindered pharmaceutical companies' capacity to make precise production plans and ensured an inadequate supply of public drugs, which were not available when needed. Moreover, material procurement remained contingent on imported raw materials, with a lead time ranging from one to three months, thereby amplifying the potential for public drug supply shortages.</p>		
6	Khoe <i>et al.</i> , 2020	The implementation of community-based diabetes and hypertension management care program in Indonesia	This study employed a cross-sectional, utilizing secondary data analysis	13 Regions in Indonesia (Java and outside Java)	<p>In 2016, Prolanis experienced a significant increases in annual costs, reaching almost three times the previous year's expenditure. However, costs per individual decreased by more than 50%. After two years of UHC implementation, the number of participants and total cost increased, but individual cost</p>	NA	The Prolanis program is specifically designed to meet the needs of diabetes and hypertension patients.

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					decreased. Total medical costs in Java differed significantly from those outside Java		
7	Saputra <i>et al.</i> , 2019	Evaluation of Drug Procurement with E-purchasing through E-catalog at Grhasia Mental Hospital, Yogyakarta Special Region in 2017-2018	Qualitative methodology with a case study design	Ghrasia Mental Hospital in Special Region of Yogyakarta	Lead time and drug vacancies in the e-catalog represent external challenges associated with drug procurement using the e-purchasing method at Grhasia Mental Hospital. Concurrently, there are internal issues, including a shortage of personnel with the necessary expertise to fulfill the role of drug procurement officials, inadequate coordination resulting from the absence of a formal drug procurement organizational structure chart, and budgetary inefficiencies stemming from the unsuccessful e-purchasing process.	A review of the organizational structure for drug procurement at Grhasia Mental Hospital reveals the absence of a designated chart. The cost of medications procured through the direct procurement method, owing to a malfunction in the e-purchasing process, is notably higher. It is also noteworthy that the individual responsible for drug procurement at Grhasia Mental Hospital does not possess the qualifications of a pharmaceutical professional.	NA
8	Arwani <i>et al.</i> , 2022	Drug Management Evaluation at the Regional General Hospital Pharmacy Installation of South Tapanuli	Qualitative study using interviews and observations	District General Hospital of South Tapanuli	The management steps that comply with the standards were Selection/planning: most of the available medicines are in	The procedure of e-purchasing was time-consuming, resulting in a procurement frequency of less than twelve times per year,	NA

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					accordance with the hospital formulary; Procurement: procurement used the e-purchasing method based on e-catalog and manual order letter to wholesalers; Storage: alphabetical storage and one hundred percent data recorded on the stock card was accurate.	which fell below the standard. It might negatively impact the availability of medicines.	
9	Ningsih <i>et al.</i> , 2015	The relationship of electronic catalog implementation to procurement efficiency and drug availability	Cross-sectional survey design	RSUD Panembahan Senopati Bantul, RSDUD Sleman, RSUD Wates dan RSUD Kota Yogyakarta	The implementation of e-catalog system, both e-purchasing and manual purchasing processes, encompassed indicators of preparation, execution, and benefits. These indicators had a significant correlation with procurement efficiency and medicine availability in Class B Hospitals in Yogyakarta.	The importance of maintaining the quality of health services in hospitals.	NA
10	Gauthfa <i>et al.</i> , 2016	Impact of National Health Insurance Implementation on Drug Availability at Referral Pharmacies in Cibeunying Area,	Qualitative research with grounded theory approach	Pharmacies in Cibeunying Bandung Region in March-December 2015	The implementation of JKN had an impact on medicine availability. Pharmacies continued to encounter impediments in providing national formulary drugs due to	In the procurement of medicines based on the national formulary, pharmacists may procure medicines through e-purchasing using the e-catalog	NA

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		Bandung Municipality 2015			the challenges in acquiring drugs through the e-catalog of the pharmaceutical industry. This often resulted in drug shortages or the necessity of procuring drugs from alternative sources at prevailing market prices.	system. If operational issues arise with the e-purchasing application, procurement may be carried out manually. Manual purchased are conducted directly from pharmaceutical manufacturers listed in the e-catalog.	
11	Permata <i>et al.</i> , 2020	Analysis of the Impact of E-catalog Policy on Drug Procurement Profile at Fatmawati Hospital Pharmacy Installation	Observational research design, quantitative analytic with longitudinal time series.	Fatmawati General Hospital period January 2011- December 2016	There were also drugs that were not included in National Formulary but appear in the e-catalog. This resulted in the absence of reference price, which was necessary for BPJS Kesehatan to process reimbursement claims. Moreover, it created challenges for health facilities in procuring medicines, as not all required medicines were available. Another contributing factor was the suboptimal implementation of the medicine procurement mechanism through the e-catalog system.	The e-catalog policy had generally increased the volume of procurement. However, the procurement rate remained below 70%. It was primarily due to the inconsistencies between the national formulary and the e-catalog. Furthermore, the procurement mechanism through the e-catalog system had not been optimized.	The implementation of the e-catalog policy has been associated with an increase in the utilization of pharmaceuticals in accordance with the e-catalog. However, the percentage of e-catalog drug procurement remains modest, with a figure less than 70%. This disparity can be attributed, at least in part, to the incompatibility between the National Formulary and the e-catalog.
12	Nardia <i>et al.</i> ,	Policy	This research is	DKI Jakarta	This study indicated	The absence of an e-	The Referral Back

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	2021	implementation performance related to the procurement of PRB Drugs in the subdistrict primary healthcare center pharmacy and PRB pharmacy in central Jakarta quarter I,II and III of 2019	Qualitative research with a descriptive approach	Provincial Health Office, Central Jakarta Health Office, BPJS Health Central Jakarta Branch, Subdistrict primary healthcare throughout Central Jakarta and DRR Pharmacies throughout Central Jakarta.	that the implementation performance of PRB medicine procurement was suboptimal. This condition was influenced by factors such as policy standards and objective, available resources, inter-organizational communication, personnel attitudes, characteristics of the implementing organization, and economic, social, and political context. Improved coordination, stronger commitment, and regular evaluation of activities were necessary to address these issues.	monitoring account has resulted in the unavailability of certain medications included in the PRB drug list. A lack of comprehension regarding related policies persists among certain human resources personnel. The availability of budget funds exerts an influence on the drug planning process, the fulfillment of drug needs, and the ease of access to ordering through the e-catalog.	Program (PRB) has the potential to enhance the quality of health services for BPJS participants. However, the program's optimal operation is hindered by several factors. Primarily, the absence of intensive quality control and drug control, coupled with limited access to e-catalogs for pharmacy locations and PRB drugs, contributes to suboptimal PRB program functioning.
13	Irmayanti <i>et al.</i> , 2019	Exploring of medicine e-purchasing procurement at pharmacy in 2019	Descriptive qualitative research method	Mita Farma Pharmacy	Drug management through e-purchasing consists of planning, procurement, distribution, and utilization stages.	The frequency of procurement through e-catalog system ranges from 3.5-4 times per year. Manual procurement becomes unavoidable, when problems occur such as unavailability of e-catalog medicines,	NA

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						application errors, and delays in medicine delivery.	
14	Agustini <i>et al.</i> , 2022	The effectiveness of electronic purchase on ordering National Health Insurance drugs at the west Bandung pharmacy of Indonesia	The utilization of a quantitative descriptive method in conjunction with a Guttman scale is a proposed approach to assist pharmacists in their professional practice.	West Bandung Pharmacy	The e-purchasing application for medicine procurement in pharmacies has been used in accordance with the e-catalog. The service level (80%) in pharmacies has met the specified standard. This showed that e-purchasing was carried out effectively.	Procurement through the e-purchasing system faces several challenges, including delays in drug delivery, which adversely affect the availability of BPJS-covered medicine in pharmacies. In addition, discrepancies between the medicines listed in the e-catalog and the actual stock available in the pharmaceutical industry also present a significant barrier. As a result, pharmacists often resort to manual procurement by ordering medicine directly from the distributor.	NA
15	Awal <i>et al.</i> , 2020	Analysis of E-Purchasing Drug Procurement Policy at the Regional General Hospital of Simeuleu Regency	Descriptive qualitative research method	Simeuleu Regency Hospital	The availability of drugs in the hospital has not yet aligned with the established indicators. The issue of drug shortages was caused by several	Procurement challenges associated with the e-purchasing method included geographical constraints impacting internet connectivity	NA

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					constrains: the ordered quantities of medicines were not fully fulfilled, prolonged delivery times, national-level drug unavailability, and the absence of an information system that issued alerts when stock level were low-resulting in delayed ordering.	and medicine delivery; outstanding distributor payments; limited drug availability at the distributor level; and the non-returnability of expired medications.	
16	Risa <i>et al.</i> , 2020	Evaluation of Drug Procurement by E-Purchasing Based on E-catalog Using JKN Capitation Funds at Puskesmas Sekampung, East Lampung Regency	Qualitative research method	Sekampung Primary Health Care in East Lampung Regency	The procurement process using e-catalog has been carried out in accordance with established procedures. However, there was a discrepancy between the medication received and those ordered based on the medicines requirement plan (RKO). The ordering process was delayed, and drug realization did not reach 100%.	The difference between the number of medicines ordered and the number received was caused by several factors. These included the lengthy process of issuing decision letters (SK) from parties involved in e-purchasing, a lengthy approval process, and the fact that orders are often placed at the end of the year. This timing overlaps with orders from other primary healthcares (PHCs), making it difficult for distributors to meet all the demand.	NA
17	Tuti <i>et al.</i> ,	Factors affecting	The method	Kediri	Pharmacies are	Procurement of drugs	The issue of

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	2018	the drug availability on Program Rujuk Balik (PRB) at PRB drug facility in ex-Karesidenan Kediri (study of hypertension drugs)	used is cross-sectional	Karesidenan region in 7 districts/cities (with 18 DRM Health Care Facilities)	required to provide medications as prescribed to meet patients' therapeutic needs. Challenges in ensuring the availability of drugs listed under the National Formulary for PRB must be addressed through alternative strategies, such as borrowing from regular patient service inventories, referring patients to another PRB-affiliated pharmacy, conducting independent procurement beyond the e-catalog price ceiling.	through e-purchasing was associated with long waiting times. Pharmacists often borrow stock allocated for non-BPJS patients or from other pharmacies to solve this problem.	medicine availability in PRB pharmaceutical service was due to the procurement system not yet utilizing an e-purchasing method based on the e-catalog. As a result, procurement remains conditional, lacks a fixed schedule, and was carried out only when stock levels were already low.
18	Raharni <i>et al.</i> , 2018	Drug Independence and Availability in of National Health Insurance (JKN) Era: Drug, Price, and Production Policy	Cross-sectional	DKI Jakarta Province, West Java Province (Depok and Bekasi), and Banten Province	The government's policy regarding the pricing of JKN medicine, particularly generic medicines, had not significantly favored the interest of the public. Furthermore, the medicine price control policy, which aimed to ensure the availability of medicine in JKN era, has not been optimally utilized by public. To address this	A fundamental challenge in the availability of generic medicines lies in the reliance on pharmaceutical raw materials. Approximately 96% of these raw materials in Indonesia are imported, rendering the supply highly susceptible to exchange rate fluctuations—	NA

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					issue, the government must prioritize pharmaceutical self-efficiency by promoting the domestic production of pharmaceutical raw materials. This was crucial because, to this days, most of these raw materials were still imported, and their prices continue to soar. The prioritization of raw material production should be based on local, extractive, and fermentative resources.	particularly the appreciation of the US dollar—which consequently leads to increased costs of pharmaceutical production inputs..	
19	Taufiq <i>et al.</i> , 2020	Analysis of drugs Procurement in national health insurance services at Roemani Muhammadiyah Hospital Semarang	Qualitative research with descriptive approach	Roemani Muhammadiyah Hospital Semarang	The findings indicated that the management of pharmaceuticals did not fully align with the established criteria. This finding was substantiated by the five indicators measured, of which two were aligned with the established criteria, including the percentage of available funds compared to planned costs and the frequency of procurement of each drug item. Conversely,	A review of various issues in the procurement process reveals a series of persistent challenges. These include slow response times from suppliers, the unavailability of certain medicines in the e-catalog, prolonged system loading times, stockouts, occasional lack of system information, delays in drug delivery, and invoices being	The pharmaceutical procurement process faces several challenges, including delayed responses from suppliers, the unavailability of medicines in the e-catalog, outdated procurement systems, missing products in the catalog, unexpected or inconsistent information,

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					<p>the remaining three indicators exhibited non-conformity with the established criteria. These indicators included the frequency of non-fulfillment of order lists/contracts, delays in payment by the hospital, and the percentage of drugs taken with those approved.</p>	<p>submitted close to their due dates—which may result in delayed payments to distributor.</p>	<p>delays in medicine delivery, and untimely submission of invoices. These delays may lead to hospitals experiencing difficulties processing timely payments to their vendors or partners.</p>

Note: NA (Not Available)

The JKN drug stockout is an obstacle that both private and public health facilities always encounter. Due to drug stockout, the health facilities in collaboration with BPJS are required to make efforts to obtain the drugs to provide services to JKN participants. These efforts include purchasing the drugs at regular prices (not in accordance with the prices shown in the E-catalog), purchasing the drugs directly not through the E-catalog so they have to spend more on drug procurement funds, or borrowing drugs from other health facilities, which may cause a mismatch in drug availability (Raharni *et al.*, 2018).

Another external obstacle is the long delivery time of drugs. This is caused by several things, including the long procurement flow through the drug E-catalog, which causes a less effective drug procurement process. In its implementation, the winning provider does not fulfill the needs of health facilities in accordance with the medicine procurement planning (RKO) that has been prepared. In addition, providers prioritize the fulfillment of medications in specific health facilities, such as the General Hospital, Regional Hospital, and Health Office (Sutriatmoko *et al.*, 2015).

The e-catalog policy, which was implemented in the context of the National Health Insurance (JKN) program in Indonesia, has a substantial impact on the drug procurement process and the overall health system. The following are some of the key impacts of the e-catalog policy on drug procurement in the context of JKN:

3.1. Transparency and accountability

Transparency: the e-catalog enables public, including stakeholders in JKN, to access the latest information regarding drug process, specifications and providers. This can reduce the occurrence of corruption and unethical in the drug procurement process. Accountability is enhanced by the electronic recording of transactions, facilitating the monitoring and verification of drug procurement decisions, and consequently, promoting fiscal responsibility. Efficiency and cost saving: the e-catalog streamlines the procurement process by centralizing drug searches and purchases on a single platform. This result in a reduction of administrative time and costs. Furthermore, the transparency of pricing data enables buyers to compare drug prices from different suppliers and select the most cost-effective option, thereby achieving cost savings (Anggraini *et al.*, 2020; Khoe *et al.*, 2020; Sihaloho *et al.*, 2024). The study conducted by Risa *et al.* (2016) yielded different finding, indicating that the e-purchasing process through the e-catalog was time consuming due to the involvement of multiple stakeholders.

3.2. Availability of medicine

The e-catalog was expected to facilitate ease of access to information regarding drug availability, thereby enabling health facilities to more effectively plan and manage their drug inventories. The system has been shown to reduce stock-outs by enabling real-time information exchange and enhancing planning efficiency. Therefore, the medicines stockout can be avoided. However, the previous study explained that several pharmacies and hospital installation pharmacies experiences medicine shortages because some medicines in the e-catalog were stock out and the delivery of medicines took a long time (Ningsih *et al*, 2015; Gauthfa *et al.*, 2016; Awal *et al.*, 2020; Permata *et al.*, 2020).

3.3. Quality and standards

Quality assurance: E-catalogs usually include drug specifications and quality standards, making it easier to ensure that the drugs purchased meet the predetermined standards. Improved standards: with more standardized processes, there is a push to improve the quality of medicines and services provided by providers (Polii *et al.*, 2021).

3.4. Integration with JKN system

Better coordination: E-catalog integrated with the JKN system facilitates coordination between various parties such as hospitals, clinics, and drug providers. Uniform and integrated data help in more effective planning and implementation of health programs. Improved budget management: the system facilitates better budget planning by providing accurate and up-to-date data on drug costs, which is critical for JKN fund management (Ningsih *et al.*, 2015; Veronica *et al.*, 2019; Rahardjo *et al.*, 2022).

3.5. Challenges and constraints

Technology adaptation: some health facilities personel or drug providers may face challenges in adopting e-catalog technology, especially if they are less familiar with digital systems (Saputra *et al.*, 2019). Connectivity issues: in some areas with inadequate digital infrastructure, access and use of the e-catalog may be a challenge (Sutriatmoko *et al* ,2015; Awal *et al.*, 2020).

It is hoped that the Ministry of Health of the Republic of Indonesia, BPJS Kesehatan and related parties in this policy can improve coordination in monitoring and evaluating drug procurement in the JKN era.

Conclusion

The e-catalog strategy has the capacity to significantly enhance drug procurement in the JKN era by augmenting efficiency, transparency, and accountability. Nonetheless, its adoption

necessitates addressing current difficulties and ensuring that all stakeholders can properly utilize the system.

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