

## ABSTRAK

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Program Studi : Farmasi  
Judul : Efektivitas *Blockchain* Dalam *Supply Chain* Farmasi :  
*Systematic Literature Review*

Ketersediaan obat yang aman, bermutu dan terjangkau masih menjadi tantangan karena keterlacakan yang terbatas, fragmentasi data antar pelaku, serta risiko obat substandard/*falsified*. Penelitian ini bertujuan untuk mengidentifikasi profil masalah *supply chain* farmasi menurut kelompok pendapatan negara (HICs, UMICs/LMICs dan LICs/LDCs), menilai karakteristik dan efektivitas penerapan *blockchain* pada *supply chain* farmasi dan memetakan kesesuaian kemampuan *blockchain* terhadap profil masalah pada masing-masing kelompok negara. Penelitian menggunakan *systematic literature review* dengan penelusuran PubMed, *ScienceDirect*, dan *Google Scholar*. Seleksi artikel mengikuti alur PRISMA dan kriteria PICOS, kemudian dilakukan ekstraksi data dan sintesis naratif-tematik. Sebanyak 56 artikel dianalisis, terdiri dari 44 artikel *blockchain* dan 12 artikel profil masalah *supply chain*. Hasil menunjukkan *blockchain* paling sering diterapkan untuk meningkatkan *traceability*, memperkuat transparansi dan integritas data, mempercepat penelusuran dan *recall*, meningkatkan efisiensi proses, serta mendukung pencegahan dan deteksi pemalsuan atau diversion. Pemetaan komparatif menunjukkan *blockchain* paling relevan pada konteks yang membutuhkan audit *trail* dan koordinasi multipihak. Namun keberhasilan implementasi dipengaruhi standardisasi data, integrasi sistem, kesiapan SDM, infrastruktur digital dan dukungan regulasi. Secara keseluruhan, *blockchain* berpotensi menjadi *enabler* peningkatan visibilitas dan akuntabilitas *supply chain* farmasi bila diimplementasikan sesuai konteks negara. Bukti berasal dari prototipe atau simulasi, sehingga diperlukan studi implementasi lapangan yang luas.

Kata kunci: *blockchain*, rantai pasok farmasi, tinjauan pustaka sistematis.

## ABSTRACT

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*Access to safe, quality assured, and affordable medicines remains challenging due to limited traceability, fragmented information across supply-chain actors, and the risk of substandard and falsified products. This study aimed to describe supply-chain problems by income group (HICs, UMICs/LMICs, and LICs/LDCs), assess the characteristics and effectiveness of blockchain applications in pharmaceutical supply chains and map the fit between blockchain capabilities and problem profiles across income groups. A systematic literature review was conducted using PubMed, ScienceDirect, and Google Scholar. Study selection followed PRISMA and PICOS criteria, with data extracted and synthesized using narrative thematic analysis. Fifty-six articles were included: 44 on blockchain and 12 on supply-chain problem profiles. The evidence indicates blockchain is applied to improve traceability, strengthen data transparency and integrity, shorten tracing and recall times, enhance process efficiency, and support prevention or detection of counterfeiting and diversion. Mapping suggests blockchain is most relevant where audit trails, data trust, and stakeholder coordination are critical. However, implementation success depends on product identification standards, system integration, workforce readiness, digital infrastructure, and regulatory support. Blockchain can increase visibility and accountability in pharmaceutical supply chains when tailored to country context, while more evaluations are needed to confirm effectiveness under routine operational conditions.*

*Keywords: blockchain, pharmaceutical supply chain, systematic literature review.*