

INTISARI

Pengelolaan persediaan obat di UPT POAK Dinas Kesehatan Kabupaten Sleman masih menghadapi tantangan terkait tingginya nilai persediaan, risiko kedaluwarsa, serta belum optimalnya penentuan kuantitas pemesanan. Nilai *Inventory Turn Over* (ITO) item obat-obatan berada jauh di bawah standar ideal 8–12 kali per tahun, serta pada tahun 2024 tercatat kerugian akibat obat kedaluwarsa sebesar Rp27.806.788,3. Kondisi ini menunjukkan bahwa kebijakan pemesanan obat yang diterapkan belum optimal, terutama karena belum mempertimbangkan perbedaan karakteristik permintaan dan umur simpan tiap item secara kuantitatif.

Penelitian ini menggunakan metode *Heuristic (R,nQ)–Shelf Life*, yang menggabungkan pendekatan heuristik (R,nQ) dengan pertimbangan umur simpan produk. Data yang digunakan mencakup permintaan obat, harga beli, *lead time*, biaya pemesanan, biaya simpan, dan umur simpan obat. Item obat yang memenuhi asumsi distribusi normal dikelompokkan menggunakan klasifikasi ABC berbasis indeks prioritas, kemudian dihitung kuantitas pemesanan optimal, titik pemesanan kembali, frekuensi pemesanan, *fill rate*, serta iterasi pengecekan kesesuaian kuantitas pemesanan agar persediaan habis sebelum melewati umur simpan. Penelitian juga menyusun rencana penggabungan pemesanan berdasarkan *supplier* dan waktu siklus untuk menurunkan biaya pesan dan mempermudah proses pengadaan.

Hasil penelitian menunjukkan bahwa Metode heuristik (R,nQ) dengan pertimbangan umur simpan menghasilkan jumlah persediaan yang lebih sesuai dengan karakteristik permintaan, menurunkan potensi kelebihan stok dan risiko kedaluwarsa, serta mengurangi total biaya persediaan dibandingkan sistem aktual. Metode *Heuristic (R,nQ)–Shelf Life* mampu menurunkan total biaya persediaan sebesar 40,62% dibandingkan kondisi aktual ketika menggunakan frekuensi pemesanan optimal $F = 2$. Sebanyak 38 dari 179 item awalnya tidak memenuhi kriteria umur simpan, dan model ini berhasil memperbaikinya melalui iterasi. Untuk seluruh item, biaya simpan turun sebesar 3,13%, sementara untuk kelompok item yang tidak memenuhi *shelf life* mengalami penurunan biaya simpan sebesar 42,33%. Selain itu, penggabungan pemesanan berdasarkan *supplier* dan waktu siklus meningkatkan efisiensi proses pengadaan. Temuan ini menegaskan bahwa integrasi aspek umur simpan dengan pendekatan *heuristic* dapat meningkatkan efektivitas pengendalian persediaan obat di UPT POAK Dinas Kesehatan Kabupaten Sleman.

Kata kunci: Dinas Kesehatan, *Heuristic (R,nQ)*, Obat, Pengendalian Persediaan, Umur Simpan

ABSTRACT

The pharmaceutical inventory system at UPT POAK of the Sleman District Health Office still faces challenges related to high inventory levels, the risk of product expiration, and suboptimal order quantity determination. The Inventory Turn Over (ITO) values of pharmaceutical items are far below the ideal standard of 8–12 turns per year, and in 2024 losses due to expired medicines amounted to IDR 27,806,788.3. This condition indicates that the existing ordering policy has not been optimal, particularly because it does not quantitatively account for differences in demand characteristics and shelf life among items.

This study applies the Heuristic (R,nQ)–Shelf Life Method, which integrates the heuristic (R,nQ) approach with explicit consideration of product shelf life. The data used include medicine demand, purchase prices, lead times, ordering costs, holding costs, and shelf life. Items that satisfy the normal distribution assumption are classified using an ABC classification based on a priority index. Subsequently, optimal order quantities, reorder points, ordering frequencies, and fill rates are determined, followed by iterative adjustments to ensure that inventory is depleted before exceeding the product shelf life. In addition, a joint ordering plan based on suppliers and cycle times is developed to reduce ordering costs and simplify the procurement process.

The results show that the heuristic (R,nQ) method with shelf life consideration produces inventory levels that better match demand characteristics, reduces excess stock and expiration risk, and lowers total inventory costs compared to the actual system. The Heuristic (R,nQ)–Shelf Life method reduces total inventory costs by 40.62% compared to the current condition when using an optimal ordering frequency of $F = 2$. Out of 179 items, 38 initially did not meet the shelf life criteria, and the model successfully corrected these through iterative adjustments. Across all items, holding costs decreased by 3.13%, while for the group of items that initially violated shelf life constraints, holding costs were reduced by 42.33%. Furthermore, joint ordering based on suppliers and cycle times improved procurement efficiency. These findings confirm that integrating shelf life considerations with a heuristic approach can significantly enhance the effectiveness of pharmaceutical inventory control at UPT POAK of the Sleman Regency Health Office.

Keywords: Health Office, Heuristic (R,nQ), Inventory Control, Medicine, Shelf Life