

ESTIMATING THE BEST RESOURCE ALLOCATION AT AN EMERGENCY DEPARTMENT'S GREEN ZONE USING BCC SUPER EFFICIENCY AND BI-OBJECTIVE MCDEA BCC MODELS

(Menganggarkan Pengagihan Sumber yang Terbaik di Zon Hijau Jabatan Kecemasan
Menggunakan Model Kecekapan Super BCC dan Dwi-Objektif MCDEA BCC)

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ABSTRACT

Hospitals are healthcare institutions that provide medical and surgical treatment and nursing care for sick or injured people. Hospitals are generally divided into different types of departments, such as emergency, outpatients, and inpatients. The emergency department (ED) is one of the busiest departments, especially during weekends and public holidays as it handles various sorts of emergency cases. The Green Zone of an Emergency Department, which provides treatment for non-critical cases, is known to be a contributor to the extensive waiting period of patients and overcrowding. As one of the busiest departments, many patients have experienced a long waiting period before being able to receive treatment while enduring the congestion in the ED due to overcrowding of patients. This study aims to estimate the best resource allocations for improving the Emergency Department's Green Zone services. Forty resource allocations including the current and proposed allocations, have been analysed using the Data Envelopment Analysis models. Based on the comparison, the DMU36 proposed by the BCC Super Efficiency model is selected as the best and efficient resource allocation compared to the DMU18 proposed by the Bi-Objective MCDEA-BCC model in order to improve the current services in the Emergency Department's Green Zone during weekends and public holidays. The proposed resource allocation suggests the combination of four doctors and four nurses compared to the previous resource allocation of two doctors and two nurses in every shift. The result shows that the patients' waiting time before treatment at the Emergency Department's Green Zone reduces drastically from 177.80 minutes to 11.47 minutes. The findings also improved the utilisation rates of resources and managed to increase the number of patients served during weekends and public holidays.

Keywords: BCC input-oriented model; bi-objective MCDEA-BCC model; efficiency scores; super efficiency model

ABSTRAK

Hospital merupakan sebuah institusi penjagaan kesihatan yang menyediakan rawatan perubatan dan pembedahan serta penjagaan kejururawatan bagi orang yang sakit dan cedera. Secara amnya, hospital terbahagi kepada beberapa jabatan seperti kecemasan, pesakit luar, dan pesakit dalam. Jabatan kecemasan merupakan satu daripada jabatan yang paling sibuk terutamanya pada hujung minggu dan cuti umum kerana menangani pelbagai kes kecemasan. Zon Hijau bagi Jabatan Kecemasan yang menyediakan rawatan untuk kes-kes yang tidak kritikal, dikenali sebagai penyumbang kepada kesesakan dan tempoh menunggu pesakit yang lama. Sebagai jabatan tersibuk, banyak pesakit mengalami tempoh menunggu yang lama sebelum mendapat rawatan selain terpaksa bersesak disebabkan bilangan pesakit yang ramai. Kajian ini bertujuan untuk menganggarkan peruntukan sumber terbaik bagi menambah baik servis di Zon Hijau Jabatan Kecemasan. Empat puluh peruntukan sumber termasuk peruntukan semasa dan cadangan telah dianalisis menggunakan model Analisis Penyampulan

Data (APD). Berdasarkan perbandingan, DMU36 yang dicadangkan oleh Model Kecekapan Super BCC dipilih sebagai peruntukan sumber yang terbaik dan berkesan berbanding dengan DMU18 yang dicadangkan oleh Model Dwi-Objektif Analisis Penyampulan Data Pelbagai Kriteria bagi menambah baik servis semasa di Zon Hijau Jabatan Kecemasan pada hujung minggu dan cuti umum. Peruntukan sumber yang dicadangkan menunjukkan gabungan empat doktor dan empat jururawat berbanding dengan peruntukan sumber sebelumnya, iaitu dua doktor dan dua jururawat dalam setiap syif. Hasilnya menunjukkan bahawa masa menunggu pesakit sebelum rawatan di Zon Hijau Jabatan Kecemasan berkurang secara drastik daripada 177.80 minit kepada 11.47 minit. Hasil kajian juga dapat menambah baik kadar penggunaan sumber dan berjaya meningkatkan jumlah pesakit pada hujung minggu dan cuti umum.

Kata kunci: model berorientasikan input BCC; model dwi-objektif analisis penyampulan data pelbagai kriteria; skor kecekapan; model kecekapan super

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Received : 16 March 2021

Accepted : 21 July 2021

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