Simplifying and Improving ED Staff Scheduling Using Linear Programming Analysis; A Multi Pronged Approach.

Abstract

ED staff scheduling is a pandora’s box of headaches, complexities, potential interpersonal conflicts all of which may result to suboptimal patient care. The best equipment, departmental guidelines, KPIs and targets would mean to nothing if there are no personnel to carry them out. Doctors, rarely trained in organisational management methods, would previously spend hours manually transcribing, arranging and haggling to draw up the weekly staffing schedule. This presents an issue when the previous schedule maker passes over the baton of Scheduler-in-chief to a junior member with potential short deadlines whilst also juggling daily clinical duties.

This paper outlines the development of a system to simplify the staff scheduling problem by employing methods normally used in other industries by operations trained HR. This was achieved by using computational analysis, Excel formulas, self filled leave requests on online platforms all of which governed by a baseline calculated by a simplex linear programming algorithm to calculate minimum staff requirements which take into consideration fairness of staff working hours, seniority and staff skill levels while also balancing work-life balance of the staff involved and the avoidance of potential staff burnout.

All of this resulted in an online based staff schedule system currently employed at ED Hospital Melaka which is not only sensitive to staff leave requests but also preserves minimal numbers for the functional operation of the department.

The adaptation of this multi pronged strategy of linear programming to calculate and optimise numbers, online platforms and computational analysis shows that scheduling can be made easier, can be made to adapt faster to fluctuating patient levels and can lead to a reduction in complexity and time spent during the process of week to week scheduling

Keywords

Scheduling Linear Programming