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Improving practice operational efficiency through employee scheduling: a linear programming approach

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Linear programming (or also known as linear optimization) is a well known mathematical technique to achieve optimized outcome (such as higher revenue, best utilization, lower cost etc. which is the objective function) where requirements (also known as constraints) are linear in nature. The technique is well adopted across industries in business and operations planning. Dentistry finds potential application of the approach in employee utilization, stock optimization and improved patient care. This paper aims to provide the application of linear programming in the dental context and demonstrates the technique using a simple model to scheduling employees such as data hygienists and assistants across multiple offices of a dental chain in order to achieve highest efficiency. Even though dental chains which operate in multiple locations are considered more efficient and have controlling factors at a chain level, there exist inefficiencies especially in terms of employee utilization and scheduling. The linear scheduling model is developed in microsoft excel so that any practice that operates as multiple offices can implement the scheduling approach. Our results show over 40% improvement in employee utilization which results in higher profitability to practices. Employees also receive higher remuneration/improved schedules, and lesser burnouts based on the model approach. The results also become important in current situations like COVID-19 pandemic where it is essential for practices to maintain profitability and improved resource utilization. The findings can also be extended to stock scheduling, patient scheduling, and asset utilization.

Biography

Swathi Premkumar is a dentist from India and has completed her Bachelors in Dental Surgery (BDS) from Amrita Viswavidyapeetham. She also completed her MBA with healthcare management emphasis from West Texas A&M University (with CGPA of 4/4). She has clinical experience in India and has volunteered with multiple practices in Texas. Her research interests include new dental techniques and tools, implementation and adoption of management practices in dentistry and financial evaluations to improve practice efficiency.

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