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The Emergency Leadership Dashboard: A Comprehensive System for Visualizing Operations across Educational, Administrative, and Research Sectors

Introduction

Managing patient care and fulfilling administrative tasks are challenges facing healthcare systems [1]. Particularly at university hospitals, emergency departments (EDs) must carry out research and fulfill educational responsibilities. As a result of these responsibilities, educators can develop

educator burnout [2]. Providers must additionally maintain accreditation by completing continuous education and certification. Using new technology and automation, clinicians can focus on patient care and quality service, reducing administrative burdens. The goal of this study is to introduce an ED leadership dashboard that optimizes ED operational efficiency across the administrative, educational, and research areas.

Methodology

The digital dashboard was developed with Microsoft Teams, Forms, Excel, and Power BI. The system combines multiple datasets to create a comprehensive visual dashboard. The first database queries information about ED physicians and updates the related datasets, including ED research, administrative tasks, student evaluations, and performance metrics. The real-time updates and visualization on the dynamic Power BI dashboard facilitate the shift from the current paper-based data collection to an electronic workflow. Implementation includes utilizing standardized forms for data inputs about research projects, educational assessments, and administrative tasks, such as complaint management and credential monitoring. These inputs cause updates in the respective datasets and dashboard output in real time, which enhances the decision-making process by providing immediate access to performance metrics such as patient throughput. The dashboard ensures consistency, improves administrative efficiency, and supports a proactive approach to management and educational evaluations within the ED.

Results

The research dashboard monitors research activities, allows users to select by year and quarter, and displays interactive visualizations. Projects are categorized into "Original Research" and "Case Report," with Original Research being more common. The stages of research (Writing, Analysis, and Data Collection) are depicted in a donut chart, where Data Collection was found to be the most prevalent. The status of the projects is shown as "On Track," "Completed," or "Delayed," with most projects currently on track. An analysis of research types showed that Retrospective studies were the most frequent (Figure 1). The physician's involvement in each project is also tracked to distribute the project load among faculty. The training and certification dashboard shows completion rates for certifications such as Basic Life Support and Advanced Cardiovascular Life Support, with most completion rates near perfect. Safety training showed a low completion rate of 35%. 574 certifications were completed, and 10 were pending, for an overall 98% completion rate. (Figure 2)



Figure 1: Research Dashboard

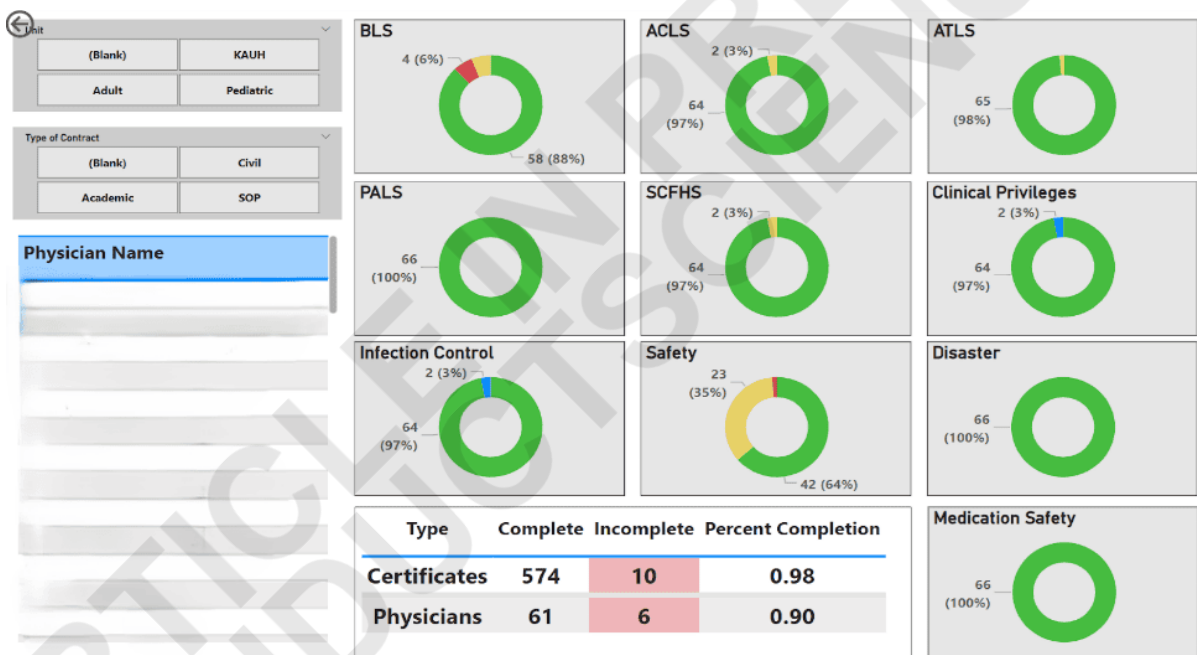


Figure 2: Certification Dashboard

Conclusion

The implementation of an ED leadership dashboard in university hospital emergency departments has markedly enhanced operational efficiency across administrative, educational, and research functions. Utilizing technologies like Microsoft Teams, Forms, Excel, and Power BI, the dashboard has transitioned from paper-based systems to a streamlined electronic workflow, enabling real-time data visualization and updates. This has improved decision-making processes, optimally distributed faculty workloads, and maintained high certification completion rates, while also highlighting areas for improvement such as safety training. Overall, the dashboard has effectively managed patient care and administrative tasks, reducing burdens and supporting proactive management within the emergency department.

References

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