

A MODEL TO REDUCE PATIENT WAITING TIMES IN OUT-PATIENT DEPARTMENT OF A GOVERNMENT HOSPITAL USING QUEUING THEORY

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Waiting time is an important indicator of effective patient management in hospital outpatient departments (OPD). The ineffective patient queue management leads overcrowding of patients in OPDs and this is one of major challenging problems in OPDs. By the unnecessary queue waits, the patients' not only suffer from their disease but also waste their valuable time. The queuing theory is the mathematics of waiting lines. This research used queuing theory to analyze and find current waiting times of the patients in OPD and predict waiting times by the increase of servers at each service point. Initially, the researcher studied the current flow of patients in OPD and found that there were three service points. The registration service point, consultations service point and drug issuing service point. There was only one staff member to serve patient at each service point. The queue discipline is first come first serve and the system adapts the idea of Tandem queue system. Data for the research like patients arrival times and service times for each service point were directly observed over a week. The two fundamental parameters of queuing theory analysis are arrival rate (λ) and service rate (μ). These rates calculated by the observed data and tea breaks and lunchtime were excluded during the calculation of service rate. The bottleneck of the system was at the consultation service point onwards. Suitable number of servers at each service point was suggested by using the result of queuing theory analysis. The results also shows that the waiting times of the patients can be reduce from suggested OPD system. Further, this rate is achieved through theoretical study and a simulated system has been proposed to be implemented to decrease waiting times in OPD queues at hospital for patient management.

Keywords: *Queuing theory, Patients management system, Tandem queues, Outpatient department*