

A Five Year Retrospective Study of Bed Utilization Trends in a Tertiary Care Teaching Institution

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Abstract

Healthcare resources need to maintain pace with the increasing population and expectations. A hospital bed is a very important but limited healthcare resource. This 5 year study analyses the trends in the various bed utilization indices, bed utilization being an objective measure of the efficiency of any hospital management system. The study indicates that although the various indices fall within the described optimal, there is yet a lot of reserve on the available resources particularly so far as a hospital bed is concerned. The study emphasizes the role of analysis and assessment of bed utilization indices with a view to improving utilization of this scarce resource.

Key Words

Bed Utilization Indices, Hospital Process, Healthcare Expenditure, Bed Turnover Ratio

Introduction

Hospital costs are the largest component of health expenditure and they have therefore been a key focus in the drive for increased efficiency in the health sector (1). In an era of increasing costs and population with consequent strain on resources it becomes imperative to utilize the suitable healthcare resources to the maximum possible extent. Given the disparity between the population and the available medical facilities, a suitable bed is a scarce commodity indeed in the Indian context. This assumes significance in light of the fact that availability of beds is the most important factor when it comes to the determination of hospital resources in any country.

In India shortage of beds is indeed a huge problem considering that the average bed population ratio is 6.8:10000 (2). Moreover the cost of making available a new bed varies between Rs. 50,000 to Rs. 100,000 and

then there are additional costs of maintenance to be considered so as well (3). Scarcity of beds is further compounded by the underutilization of hospital resources. Hence efficient bed management not only helps to make up for the paucity of beds to some extent but also brings about significant financial benefits in its wake.

Against this background it is quite evident that hospital administrators are in dire need of objective measures and methods to improve the utilization of their scarce resources which include hospital beds. It is with this objective that this paper seeks to analyze the various indices of hospital bed utilization.

Materials and Method

A 5 year retrospective study was carried out in the 850 bedded SMHS Hospital in Kashmir which is the main hospital catering to the local population. Data was

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Table.1 Size of Admissions from the Year 2003-2007

Year	Total Admissions
2003	38726
2004	40951
2005	41291
2006	42482
2007	44715

average length of stay of 6.23 days in 1999 to 5.51 days in 2006.

Anand (7) in his treatise on hospital services and management considered an average length of hospital stay of 6-10 days as optimum.

Table.2 Year wise Details of Average length of Hospital Stay (ALS), Bed Turnover Ratio (BTR) & bed occupancy rate (BOR)

Year	ALS(days)	BTR	BOR (%)
2003	8.7	43.89	75.69
2004	7.9	47.78	76.43
2005	7.6	49.53	79.29
2006	7.2	52.21	82.13
2007	6.9	56.68	87.41

collected from year 2003 to 2007 and it was analyzed with reference to the following internationally accepted indices.

Average length of stay: The average period (days) of stay in the hospital per admitted patient.

Bed Occupancy rate: Percentage of occupancy of hospital beds.

Bed Turnover intervals: Average period of days during which a hospital bed remains vacant till it is occupied by a new patient.

Bed Turnover Ratio: Number of Turnovers of patients in one year for a given bed complement.

Results

The Results are shown in *Table-1&2*

Discussion

The admission rate expectedly showed a rising trend from 38726 patients in 2003 to a total of 44715 patients admitted in 2007 an increase of 15% over the five year period. A decreasing trend was seen in the average length of hospital stay, with a decrease in average stay from 8.7 days in 2003 to an average of 6.9 days in 2007.

Tripathi (4) observed an average stay of 6.55-8.76 days. Thapa *et al* (3) reported 2.7 days as an average length of stay in a rural hospital in west Bengal. Kiran *et al* (5) reported an average length of stay of 9 days in a tertiary care hospital. Vaz and Colleagues (6) reported an

Our observations compare well with these studies as well as the study by Alonao *et al* (8) in Spain who observed an average length of hospital stay of 11.5 days in 1988 and 9.5 days in 1995.

However it varies in sharp contrast with observations of Saha and others (9) who have reported a very high average length of stay of 14.02 days.

The bed occupancy rate (BOR) has been increasing steadily with an 87.41% occupancy in 2007 as against 75.69% in 2003. This high occupancy rate is an indicator of the rising pressures on the hospital as a result of increasing population and disproportionate health care facilities in the peripheries especially at specialty level.

Our observations far exceed that of Kiran *et al* (5) who reported a very low bed occupancy rate of 50-60%. Vaz *et al* (6) reported an occupancy rate of 72.13% in 1999 and 83.12% in 2006.

Cohan (10) reported a bed occupancy rate of 67.77 in an American hospital which is again considerably low as compared to our observations. However our observations fall within the optional bed occupancy rate of 80-90% as described by Anand (7) in his treatise. The bed turnover ratio(BTR) for the hospital has seen an increasing trend from 43.89 in 2003 to 56.68 in 2007. This reflects the increasing admission rates but is also an indicator towards an improved efficiency regarding utilization of bed by the

hospital. Saha *et al* (9) reported a bed turnover ratio of 20-40 in their study which is far less than the ratio observed in our study.

Dutta *et al* (11) reported a turnover ratio of more than 13.8 in their study of the gynecology wards of a district hospital. However the high bed turnover ratio (BTR) in our study is to be expected considering that this is the largest referral hospital in the region that caters to a disproportionately large population.

Conclusion

Our study found a very high value for all indices regarding hospital bed utilization. This is understandable considering that the private healthcare sector is virtually non-existent in the province. Moreover, the health care institutions in the periphery are also operating at a very low efficiency and there is paucity of specialized health care in the peripheries. This puts a tremendous strain on tertiary care institution like the one where this study was carried out. The analysis of various trends in bed utilization thus identifies the present problems as well as future contingencies in health care. This study provides an insight as to how to get the maximal benefit out of a hospital bed as also stresses the need for strengthening the peripheral health care institutions as well as encouraging of private health care sector to decrease the burden on tertiary care institutions. It is recommended that bed utilization indices be used routinely to assess, analyze and improve the available resources.

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