

FACTORS AFFECTING THE AVERAGE LENGTH OF STAY OF THE PATIENTS IN THE INPATIENT DEPARTMENT IN A TERTIARY CARE CENTRE IN NORTH INDIAAmrita¹, Amit Badgal²**HOW TO CITE THIS ARTICLE:**

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ABSTRACT: Many hospitals emphasize on stabilizing the patient, minimizing the length of stay and postponing complete diagnosis and treatment for the outpatient setting and early discharge of incompletely treated patients resulting in frequent readmissions, thereby, decreasing the quality of patient care. On the contrary, prolonged hospitalization increases the healthcare costs due to nosocomial infections and iatrogenic complications. We conducted a prospective observational study on the factors affecting average length of stay of 100 patients in the Inpatient Department in a tertiary care centre in North India. The association of Average Length of Stay with nutritional status, educational status and insurance status of the patient was found to be statistically significant.

KEYWORDS: Length of stay, patient care, hospitalization, healthcare costs, diagnosis.

INTRODUCTION: Length of Stay is the time interval between date of admission and date of discharge and is used as an indicator to evaluate the hospital resource utilization rate, efficiency, and quality of healthcare services.^{1,2} The LOS is calculated from the time between patient's admission and discharge and measures both bed utilization and inpatient units' efficiency.³ Healthcare providers have been under much political and managerial pressure to keep LOS in a desirable minimum level to reduce costs without compromising patients' outcomes.⁴ The LOS reduction level is restricted by factors such as quality and effectiveness considerations and it is important to know more about the factors that play a significant role in decreasing the patients' LOS.⁵

The previous studies have shown that factors such as age,⁶ sex,⁷ marital status,⁸ place of residence,⁹ socio-economic status,¹⁰ the month, day and time of patient admission,¹¹ patients' physical and functional status,¹² patients' status at discharge time,¹³ hospitalizing physician's academic degree,¹⁴ types and severity of illnesses,¹⁵ malignancy, complications, hospital infections, and delay in laboratory exams and in surgical interventions,¹⁶ education status and increased severity of illness¹⁷ affect the average length of stay (ALOS) in the hospital. The present study was conducted on 100 patients in the IPD department of the Fortis Escorts Hospital, Amritsar to ascertain various factors associated with prolonged or reduced length of hospital stay.

RESULTS AND OBSERVATIONS: During the study period, a total of 100 patients were admitted in the Fortis Escorts Hospital, Amritsar.

Demographic and clinical factors	Number of patients
Number	100
Male: Female	62: 38
Mean age (years)	56.15 ± 17.15
Rural: Urban	55: 45
Single: Married: Widowed	12: 78: 10
Socio-economic status Lower: middle: upper	0: 97: 3
Malnutrition	08 (8%)
Illiterate: Primary school: Secondary school: college	18: 52: 10: 20
ECHS: non-ECHS	69: 31
Health insurance	20 (20%)
Elective: Emergency	20: 80
Duration of illness Few days: weeks: years	32: 49: 19
Multi-system involvement	52 (52%)
Malignancy	03 (3%)
Surgical intervention	38 (38%)
Complications of illness	02 (2%)
Previous hospitalizations Once: twice: multiple: none	37: 15: 24: 24
Patient satisfaction with healthcare	87 (87%)
Recovery: Relative recovery	85: 14
ALOS (years)	7.07 ± 5.21
Table showing Socio-demographic and clinical characteristics of the patients:	

DISCUSSION: The ALOS refers to the number of days (with an overnight stay) that patients spend in an acute-care inpatient institution. It is generally measured by dividing the total number of days stayed by all patients in the acute-care inpatient public institutions during a year by the number of admissions or discharges. It is often used as an indicator of efficiency of the hospital.^[18] However, policies exclusively focused on lowering LOS may not directly lead to a reduction in inappropriate hospital utilization.^[19]

Age: The analysis of the data revealed that the mean age of the patients admitted in IPD in the Fortis Escorts Hospital was 56.15 years (SD ± 17.70), the minimum age was 7 years and maximum age was 92 years. Wright SP et al. (2003) in his study reported a mean age of 73 years (S.D. 10.8).^[20] Agboado G et al. (2012) in a cross-sectional study of factors influencing the length of hospital stay among patients admitted with chronic obstructive airway disease reported a mean age of 70.1 years.^[21]

Sex: The analysis of the data revealed that out of 100 patients, 62 (62%) were males and 38 (38%) was females. The male: female ratio was 1.6: 1. Wright SP et al. 2003 in their study of factors

influencing the length of hospital stay of patients with heart failure found that 60% were males, 40% were females and a male: female ratio of 1.5: 1.^[20]

Residence: Out of 100 patients, 55 (55%) were from rural areas and 45 (45%) were from urban areas. The association of the place of residence with LOS was not statistically significant ($p=0.36$). Agboado G et al. (2012) too in their study did not find a significant association between LOS and the place of residence.^[21]

Marital Status: 12(12%) of the patients were single (unmarried), 78(78%) were married and 10(10%) were widowed. The association of the marital status with LOS was not statistically significant ($p=0.39$).

ECHS Patients: Out of 100 patients, 69(69%) were ECHS patients and 31(31%) were non-ECHS (self-paying) patients. In their study, Chistie KM et al (1973), had also reported a shorter LOS in “non-paying” (ECHS) patients than “paying patients”.^[22]

Socio-economic Status: Out of 100 patients, 97(97%) were from the middle class of the society and 3(3%) were from the higher socio-economic class of the society, none belonged to the lower socio-economic class of the society, the majority of the patients admitted in the IPD of the Fortis Escorts Hospital, Amritsar during the study period belonged to the middle socio-economic class of the society and the number of patients from the lower and higher socio-economic strata was not sufficient enough to make some statistically significant opinion. Chistie KM et al (1973) in their study did not report a statistically significant association between LOS and the socio-economic status of the patients.^[22]

Nutritional Status: Out of 100 patients in the study, 92(92%) had adequate nutrition but 8(8%) were malnourished. Out of 92 adequately nourished patients, 44(47.82%) had LOS between 1-5 days, 35(38.04%) had LOS between 6-10 days, 13(14.13%) had LOS longer than 11 days. Out of 8 malnourished patients, 4(50%) had LOS between 1-5 days, 2(25%) had LOS between 6-10 days and 2(25%) had LOS longer than 11 days. It can be clearly inferred that malnourished patients had longer LOS than adequately nourished patients and the difference was statistically significant ($p<0.05$). In their study, Robinson G et al (1987) had also reported longer LOS in malnourished patients than adequately nourished patients.^[23]

Education Status: In the present study, 18(18%) patients were illiterate, 52(52%) patients had primary school education, 10(10%) patients had secondary school education and 20(20%) patients had graduated in the college. Esatoglu AE et al (2002) in their study had made similar observations, thereby, reporting that illiterates had longer LOS than literate patients and the difference was meaningfully significant.^[24]

Insurance Status: Out of 20 insured patients, 6(30%) patients had LOS between 1-5 days, 13(65%) patients had LOS between 6-10 days, 1(5%) had LOS between 21-25 days. Out of 80 uninsured patients, 42(52.50%) patients had LOS between 1-5 days, 24(30%) patients had LOS between 6-10

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days whereas 12(15%) patients had LOS between 11-20 days whereas 2 (2.5%) patients had LOS longer than 21 days. So, the patients without insurance had a shorter LOS than those who were insured. It, hereby, implies from the data analysis that there exists a statistically significant positive association between the insurance status and the LOS ($p < 0.05$). Manious AG et al (2011) in their study made similar observations and reported a significantly shorter LOS in patients without insurance than those with insurance.^[25]

Reimbursement: 32(80%) of the 40patients with claim for reimbursement had LOS between 1-10 days whereas 51(85%) patients out of 60 patients without claim for reimbursement had LOS between 1-10 days. So, the length of stay was shorter in patients with claim for reimbursement. Jones RP et al (2013) too in their study had found truncating effect of medicare reimbursement on ALOS in US hospitals.^[26]

The duration of illness, associated co-morbidities, referring authority, history of surgical intervention or previous hospitalization, complications of the illness and the patient satisfaction were not significantly associated with LOS in the present study.

CONCLUSION: ALOS is an indicator of the efficiency of a hospital but principal focus should be on lowering the inappropriate hospital utilization because lowering the LOS may not directly lower the inappropriate utilization of the medical facilities. The LOS is prolonged in elderly patients, females, malnourished, illiterates and insured patients. The elderly and malnourished patients are more likely to develop complications of the illness, the illiterate patients have prolonged LOS in view of the lack of insight into the graveness of the illness and are more likely to fail to adhere to their dosage schedule. The females are more likely to develop certain medical conditions with social dimensions like anemia, malnutrition, etc., thereby increasing the LOS. The LOS was more in insured patients because they were more likely to receive treatment and complete the treatment regardless of the cost of the treatment. Further studies with larger sample size are required to establish the association of LOS with the duration of illness, associated co-morbidities, referring authority, history of surgical intervention or previous hospitalization, complications of the illness and the patients' satisfaction.

REFERENCES:

1. John P.Vavalle, Renato D. Lopes, Anita Y. Chen, L. kristin Newby, Tracy Y. Wang, Bimal R. Shah, P. Michael Ho, Stephen D, Wiviott, Eric D. Peterson, Matthew T. Roe, Christopher B. Granger. Hospital Length of Stay in Patients with Non-ST-segment Elevation Myocardial Infarction. *The American Journal of Medicine*.2012; 125(11): 1085-94.
2. Ravangad R, Arab M, Rashidian A, Akbarisari A, Zare A, Zeraati H. Patients' Length of Stay in Women Hospital and Its Associated Clinical and Non-Clinical Factors. *Iran Red Crescent Med J*. 2011; 13(5): 309–315.
3. Jiménez R, López L, Dominguez D, Fariñas H. Difference between observed and predicted length of stay as an indicator of inpatient care inefficiency. *Int J Qual Health Care*.1999; 11:375–84.
4. Clarke A. Why are we trying to reduce length of stay? Evaluation of the costs and benefits of reducing time in hospital must start from the objectives that govern change. *Qual Health Care*. 1996; 5: 172–9.

ORIGINAL ARTICLE

5. Cannoodt LJ, Knickman JR. The effect of hospital characteristics and organizational factors on pre- and postoperative lengths of hospital stay. *Health Serv Res.* 1984; 19:561–85.
6. Gholivahidi R, Kooshavar H, Khodayari R. The study of patient's length of stay and its associated factors in Tabriz Shahid Madani Cardiovascular Hospital: *JHA.* 2006; 9:63–8.
7. Nietert PF, Silverstein MF, Silver RM. Hospital admissions, length of stay, charges, and in-hospital death among patients with systemic sclerosis. *J Rheumatol.* 2001; 28:2031–37.
8. Rafiee M, Ayat-ol-lahi SM-T. Stay of patients admitted to intensive of mortality rate and length of stay of patients admitted into the intensive care unit in Arak Vali-Asr Hospital. *Iran Society Anesth Intensive Care J.* 2006; 2:54–63.
9. Salehi M. Study of patient's length of stay and its associated factors in Tehran Shariati Hospital's surgical units using Multiple Cox Proportional Hazards Model in 2005. Tehran: Tehran University of Medical Sciences, School of Public Health; 2006-2007. (In Persian)
10. Singh C, Ladusingh L. Inpatient length of stay: a finite mixture modeling analysis. *Eur J Health Econ.* 2010; 11: 119–26.
11. Tu JV, Mazer CD, Levinton C, Armstrong PW, Naylor CD. A Predictive Index for Length of Stay in the Intensive Care Unit Following Cardiac Surgery. *CMAJ.* 1994; 151: 177–85.
12. Brasel KF, Lim HF, Nirula RF, Weigelt JA. Length of stay: an appropriate quality measure? *Arch Surg.* 2007; 142: 461–65.
13. Faraji Khiavi F. Study of patient's satisfaction, hotelling costs and length of stay in Tehran general hospitals' CCUs in 1998. Tehran: Tehran University of Medical Sciences, School of Public Health; 1998 (In Persian).
14. Moloney ED, Smith D, Bennett K, O'Riordan D, Silke B. Impact of an acute medical admission unit on length of hospital stay, and emergency department 'wait times'. *QJM.* 2005; 98:283–9.
15. Kjekshus LE. Primary health care and hospital interactions: Effects for hospital length of stay. *Scand J Public Health.* 2005; 33: 114–22.
16. Aguirre-Gas H. The factors associated with a lengthy hospital stay in a third-level unit. *Gac Med Mex.* 1997; 133 (2): 71-7.
17. Haghparast-Bidgoli et al. *BMC Health Services Research* 2013, 13:281.
18. OECD (2013). "Average length of stay in hospitals". *Health at a Glance 2013: OECD indicators.* Nov 2013; 21(92-93).
19. Alonso J, Munoz A, Anto JM. Using length of stay and inactive days in the hospital to assess appropriateness of utilization in Barcelona, Spain. *J Epidemiol Community Health.* 1996; 50 (2): 196-201.
20. Wright SP et al. The factors influencing the length of hospital stay of patients with heart failure. *The European Journal of Heart Failure.* 2003; 5: 201-09.
21. Agboado G, Jonathan Peters, Lynn Donkin. Factors influencing the length of hospital stay among patients resident in Blackpool admitted with COPD: a cross-sectional study. *BMJ Open* 2012; 2.
22. Chishtie K.M, Gaiind M.L. Study of factors affecting the average length of stay of patients in the private wards block at all India institute of medical sciences, doha, aiims, January, 1973 Thesis 0019 (1-3).
23. Robinson G, Goldstein M, Levine GM. Impact of nutritional status on DRG length of stay. *J PEN J Parenter Nutr.* 1987; 11(1):49-51.

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24. Esatoglu AE, Bozat S. Survey on the length of stay for the patients with chronic obstructive pulmonary disease: An application on Ataturk Chest Disease Hospital. Journal of Ankara Medical School. 2002; 8(24): 165-176.
25. Mainous AG, Diaz VA, Everett CJ, Knoll ME. Impact of Insurance and Hospital Ownership ON Hospital Length of Stay among Patients with Ambulatory Care-Sensitive Conditions. Ann Fam Med.2011; 9(6):489-495.
26. Jones RP. Factors responsible for differences in average length of stay in US hospitals. British Journal of Healthcare Management.2013; 19(4):186-191.

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