

OPERATIONAL PERFORMANCE AND BUDGET CONSTRAINTS: CASE STUDY IN A PUBLIC HOSPITAL SPECIALIZED IN HEMATOLOGY

Recebido em: 17/01/2023

Aprovado em: 24/01/2023

Antônio André Cunha Callado

Universidade Federal Rural de Pernambuco
Brazil

ORCID: 0000-0002-5704-9265

Email: andrecallado@yahoo.com.br

Fábia Michelle Rodrigues de Araújo Callado

Fundação HEMOPE
Brazil

ORCID: 0000-0001-6328-0140

Email: fabiamrac@yahoo.com.br

ABSTRACT

The objective of this paper is to analyze the impact of budget constraints of the Brazilian public sector on operational performance indicators in a hematology specialized Hospital. In order to carry out this research a case study approach was designed considering average length of stay, occupancy rate, hospital mortality rate. Data regarding results of these indicators were obtained considering two periods of time. The first period was from January 2013 to December 2014 and the second period was from January 2015 to September 2016. Expected performance reference values from these indicators were also obtained. Data were obtained from official performance reports. The starting point for budget constraints considered was January 2015. Descriptive statistics was used to present the operational performance obtained. Mann-Whitney U test was used to analyze the presence of significant differences ($p=0.05$) in operational performance for the performance indicators considered. The results point out that, despite budget constraints, the operational performance regarding occupancy rates and hospital mortality rate did not presented statistically significant differences. Average length of stay was higher in the second period.

Keywords: Performance measurement, Operational performance, Public hospital performance.



1. INTRODUCTION

Over the last decades, Brazilian public organizations have been expected to improve both performance and quality of services provided to society as well as to be transparent. However, the difficulties faced by managers in most of them regarding budget constraints due to the financial crisis of the public sector have caused unexpected challenges to delivering expected results generating negative impacts from lower levels of performance for some of the services provided. In recent decades, public organizations have needed to change their allocation of resources, due to requirements such as: transparency in accountability, quality of services and insufficient budgetary resources (Carvalho Filho & Amorim, 2020).

Until recently, health care organizations were considered as charity institutions, however nowadays they are seeking to improve both management procedures and management support systems (Souza et al, 2011, Martins et al, 2012). Performance measurement is a strategic operation that can generate central management information. The use increase of non-financial performance indicators is related to the inability of financial measures to provide all the information necessary to manage organizations in the current operational environment (Bernard, 1999).

Specific characteristics regarding operational activities may require specific set of performance indicators to be considered. The desirable set of performance indicators is related to the definition of the measurements that should be considered, where the relevant performance attributes that will be adopted as the evaluation reference must be identified Miranda et al (2001).

The selection of performance indicators is part of a logical sequence of managerial procedures within the development and implementation of a measurement and performance evaluation system. These measures should be oriented towards the future, aiming to define objectives that reflect the goals of the organization. The implementation of performance measurement criteria in the context of public administration involves relevant issues, among them the adoption of indicators derived from operational aspects (Silva & Drumend, 2004). Doing so, organizations should obtain managerial reports that can compare the actual results with the previously established goals. Doing so, organizations are able to monitor their own performance, as well as their capacity to provide satisfaction to stakeholders.

Major stakeholders such as government, patients, health insurance companies, lenders and society in general, have been demanding hospital organizations have to seek mechanisms to enable the improvement of their performance (Souza et al, 2011, Alastico & Toledo, 2012, Guimarães & Costa, 2005).

The increasing demand for health services, rising hospital costs and resource constraints have generated greater interest regarding performance measurements (Campbell et al, 2000), but the difficulties regarding the measurement of performance of operational activities within hospital organizations are significant (Godoy et al, 2013).

The literature does not present previous evidence regarding operational performance in public hospitals and this paper intent to provide some results by investigating the effect of budget constraints on the operational performance of a Brazilian public hospital specialized in hematology. The objective of this paper is to analyze the impact of budget constraints of the Brazilian public sector on operational performance indicators in a hematology specialized Hospital located in the northeast Region of Brazil.

2. LITERATURE REVIEW

Performance expresses a term derived as a perception of a network of collectively shared meanings within a given social context (Misoczky & Vieira, 2001). Performance

indicators are basic tools for organizational management that serve to describe the current situation of a particular process to assist the process of decision-making in the analysis of results, planning for future actions and identifying trends (Vieira et al, 2006).

Performance indicators can be defined as measurable parameters that provide relevant information about a particular phenomenon (Alastico & Toledo, 2012). Performance indicators can also be defined as numerical references with data that generate information about a phenomenon that can be useful to the decision-making process (Godoy et al, 2013).

Starting from the composition of the operational process, performance indicators can be understood as simple indicators or composite indicators. Simple indicators are generally self-explanatory, they immediately describe a particular aspect of the hospital organizational reality or have a relationship between actions or situations, are excellent in conducting sectoral assessments, and in assessing compliance of pre-established goals.

Composite indicators are those that represent, in a synthetic way, a number of aspects of the reality of hospital organizations, grouping several simple indicators into a single number by establishing some form of relationship between them, either considering them equally or setting different relative importance among them (Vieira et al, 2006).

The performance evaluation methods of hospital organizations can be classified into two separate strands (Alastico & Toledo, 2012). The first refers to the management approach that can take forms from social legitimacy, human relations, and internal processes. They also can be classified considering their types, such as financial indicators, operational indicators, and quality indicators. The selection criteria for choosing particular performance indicators to be used by managers should be associated with what they plan to assess, as well as to whom this information will be available to (Godoy et al, 2013).

To meet management objectives derived from operational controls and in measuring the performance indicators used, the indicators used should present characteristics regarding accuracy, reliability, relevance, simplicity, validity, sensitivity, cost-effectiveness, availability, and comparability (Vieira et al, 2006).

The managerial analysis of performance consists of the generation and accumulation of information in order to generate a database with historical series of actual achieved results that are critical to the assessment of the evolution of performance based comparisons (Alastico & Toledo, 2012, Godoy et al, 2013).

Starting from the generation of systematic information on performance, considered indicators can be evaluated through analysis of historical data trends, comparative analysis of Benchmarking, and combined analysis. The first analysis parameter is the calculation and management of the historical evolution of the results obtained through the use of selected performance indicators. This historical planning has the purpose of providing a comparison of trends.

The performance measurement in hospitals should consider results of the processes, activities and individuals that allow data collection capable of generating information that can be compared with established standards (WHO, 2003). The proposal of new performance indicators designed specifically for hospitals should consider the prospect of the indicators, health care aspects to be assessed, and the availability of evidence as desirable qualities (Pessoa & Kuroba, 2014)

The importance of performance indicators of hospital organizations can be attributed to the importance of evaluating the results through the measurement of management efficiency and effectiveness, and the proper use of resources (Azevedo, 1993) and that the knowledge generated from the use performance indicators can influence various organizational levels and areas (Shaw, 2015).

Health sector organizations such as hospitals can be seen as systemic entities that function through a set of interrelated activities that consume resources and provide goods

services through processes (Godoy et al, 2013). As they predominantly focus on service, hospitals have significantly complex and interdependent internal processes (Souza et al, 2009). These organizations play a fundamental role in society pertaining to the care of people, however, the search for information and the ability to evaluate and improve operational processes is not an easy task (Pessoa & Kuroba, 2014).

The internal processes of hospital organizations should be monitored and evaluated in search of efficiency, effectiveness and results in managerial efforts to reduce errors and improve services to society (Ramos & Miyake, 2010).

The management principles applied public hospital organizations differs greatly from those of private management organizations. The growing concern in the search for higher levels of efficiency and effectiveness in public resource management has required specific and detailed information on aspects that are not addressed in traditional financial reports which are insufficient and inappropriate to serve this purpose (Grateron, 1999).

The number of hospital organizations that adopt performance indicators within their daily management practices is very small and the importance of these managerial tools related to both planning and implementation of performance measurement systems of health services needs to be fully understood by managers in charge (Malik & Teles, 2001).

Performance evaluation is one of the major challenges faced by hospital organizations (Malik & Teles, 1991). Even in developed countries such as the United States, evidence from previous studies suggest that the practice of performance measurement and monitoring processes in organizations from the health care sector is poorly developed (Loeb, 2004, Williams et al, 2005). However, there is a growing awareness of the importance of using indicators designed for the purpose of improving the performance of a hospital's internal processes (Ramos & Miyake, 2010).

Public sector have been asked to improve performance of services provided to society as well as to disclose results obtained in performance assessment processes (Barbieri & Hortale, 2005) in order to make it more efficient (Biazzi et al, 1999). In search of improvements in public management efficiency, performance management has been considered as a managerial tool capable of providing monitoring metrics at various organizational levels (Odelina & Santos, 2008).

3. METHODOLOGY

This research was conducted in one of the two a hematology specialized public hospital located in the Northeast region of Brazil. In order to achieve the objective proposed for this research, the three most important single operational performance indicators regarding the internal process of the hospital were considered:

- Average length of stay;
- Occupancy rate;
- Hospital mortality rate

These performance indicators were chosen to represent properly the main operational processes carried out within the hospital's work flow. Data regarding results of these indicators were obtained from managerial reports. These data were collected considering two periods of time. The first period was from January 2013 to December 2014 and the second period was from January 2015 to September 2016.

Expected performance reference values from these indicators were also obtained. Data about both performance results and expected reference values were obtained from official performance reports. The starting point for budget constraints considered was January 2015.

Descriptive statistics was used to present the operational performance obtained. Spearman Correlation Coefficient was used to identify significant relations ($p=0.05$) between

the results from the performance indicators considered. Mann-Whitney U test was used to analyze the presence of significant differences ($p=0.05$) in operational performance for the performance indicators considered.

4. RESULTS

Considering the proposed objective and the methodology applied, the collected data was organized accordingly to the time windows considered (January 2013 to December 2014 and January 2015 to September 2016). The results are shown in Table 1.

Table 1. Descriptive statistics of the performance indicators

Operational performance indicators	Mean	Median	Minimum	Maximum	Standard Deviation
January 2013/December 2014					
Length of hospital stay	7,86667	7,80000	5,70000	10,20000	1,15659
Occupancy rate	70,48148	75,00000	33,00000	93,00000	18,55837
Mortality rate	4,68519	4,50000	0,70000	11,50000	2,32788
January 2015/September 2016					
Length of hospital stay	9,87778	9,60000	8,40000	11,80000	0,94592
Occupancy rate	71,77778	69,00000	52,00000	124,00000	16,74218
Mortality rate	5,27778	5,00000	1,50000	10,40000	2,61276

Considering the first period, the results show that all performance indicators analyzed present wide range of results. Two of them (length of hospital stay and mortality rate) present median figures bellow the mean value, while occupancy rate presented median above it. Regarding the second period, the results presented show that the mean figures from all performance indicators were higher that their respective median. This finding points out that results from this time window were lower than average.

The analysis of the results regarding the data also considered the achievement rate of each performance indicator was calculated considering their respective operational goals. The results are shown in Table 2.

Table 2. Rate of achievement regarding the reference values for the performance Indicators

Operational performance indicators	Achievement rate (%)
January 2013/December 2014	
Length of hospital stay	29,63
Occupancy rate	59,26
Mortality rate	77,78
January 2015/September 2016	

Length of hospital stay	5,56
Occupancy rate	72,22
Mortality rate	55,56

In the first period of time considered, the low achievement rate about the length of hospital stay suggests that patients took longer to recover than expected. On the other hand, the achievement rate regarding mortality rate has presented high percentage of success. Occupancy rate achievement rate did not present high results. On the other hand, results from the second period of time considered indicates that the achievement rate about the length of hospital stay has dropped along the second time window and almost all patients had spent more time in hospital that expected indicating that patients took longer to recover more often than in the previous period of time. Occupancy rate achievement has increased, but the achievement rate regarding mortality rate has dropped.

The analysis of results regarding the data from first time window, the correlations between the operational performance from the indicators considered. The results are shown in Table 3.

Table 3. Correlations between performance from the indicators

Performance indicators	Length of hospital stay	Occupancy rate	Mortality rate
January 2013/December 2014			
Length of hospital stay	1,000000	0,091256	0,116685
Occupancy rate	0,091256	1,000000	-0,122343
Mortality rate	0,116685	-0,122343	1,000000
January 2015/September 2016			
Length of hospital stay	1,000000	-0,116641	0,113990
Occupancy rate	-0,116641	1,000000	0,051733
Mortality rate	0,113990	0,051733	1,000000

The results indicate that no significant results were found, indicating that the performance from each of the performance indicators tested was not related to the results obtained from the others in the period considered. Similarly to the results obtained from the data regarding the first window time, no significant results were found, indicating that the performance from each of the performance indicators tested was not related to the results obtained from the others in the period considered.

Thirdly, monthly data from both time windows were considered to carry out the Mann-Whitney U test in order to analyze the presence of statistically significant difference between the performance regarding the three indicators. The results are presented in Table 4.

Table 4: Results from the Mann-Whitney U test

Performance indicators	U	Z	p value	Z adjusted	p value
Length of hospital stay	39,5000	-4,70316	0,000003	-4,70642	0,000003
Occupancy rate	221,5000	0,48653	0,626589	0,48673	0,626453
Mortality rate	213,5000	-0,67188	0,501661	-0,67228	0,501407

The results indicate that the differences of performance regarding length of hospital stay obtained statistically significant results, while occupancy rate and mortality rate did not. This evidence suggests that the increase in hospital stay could be related to budget constraint.

To illustrate the difference found, the descriptive statistics of each time window was used. The results are shown in Figure 1.

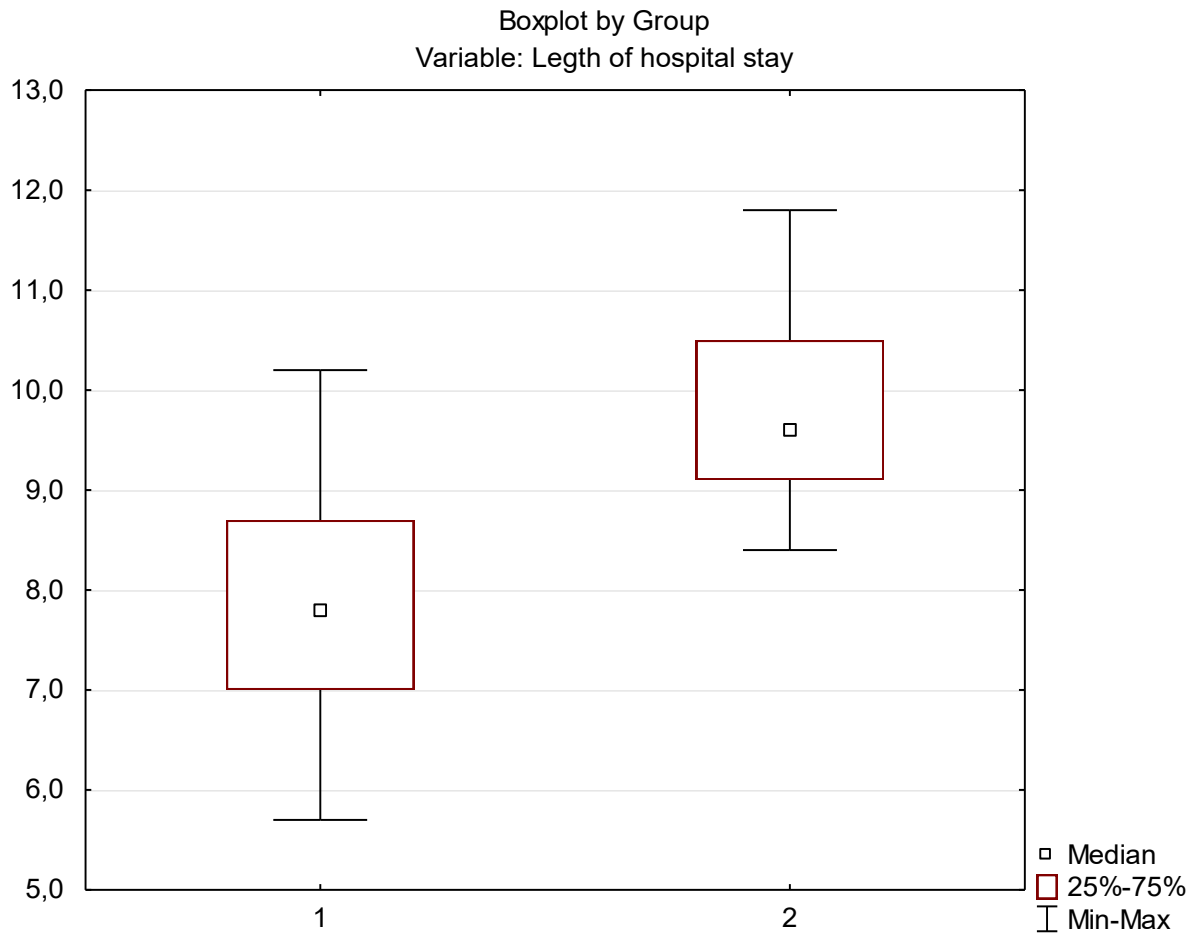


Figure 1. Distribution of length of hospital stay from the time windows

Note 1: 1 – January 2014 to December 2015;
 2 – January 2016 to September 2016.

Figure 1 shows clearly the increase in length of hospital stay from the first time window to the second, indicating that that this changes can be related to the budget constraint implemented to face the economic crisis.

These results demonstrate that the overall operational performance of the public hospital specialized in hematology investigated seemed not to be affected drastically due to the implementation of budget constraints. However, the approach applied of this research was not able to explain the main reasons why the performance regarding occupancy and mortality rates did not suffer decreases as it was evidenced on length on hospital stay.

5. CONCLUSIONS

The objective of this paper was to analyze the impact of budget constraints of the Brazilian public sector on operational performance indicators in a hematology specialized Hospital located in the northeast Region of Brazil. Data regarding three operational performance indicators from a public hospital specialized in hematology was gathered considering two time windows in search of significant influence of budget constraints on them.

Descriptive statistics showed that all operational performance indicators presented similar patterns during both periods of time. It was also observed that the mean values regarding them also have presented some changes the second time window. In addition, the achievement rates were also affected in the second period. The results also demonstrated that the operational performance on all indicators was scattered along both periods of time considered.

The statistical test performed provided evidence supporting the presence of statistically significant differences in length of hospital stay, demonstrating that somehow the shortage of financial resources could have caused it, although, despite the implementation of these budget constraints, the operational performance about both occupancy and hospital mortality rates did not presented statistically significant differences.

The lack of similar research available in the literature does not allow the establishment of any kind of comparison with previously published results. The findings point out that, despite budget constraints, in this case the overall operational performance did not presented statistically significant differences. Further studies should be able to analyze other public organizations and improve the understanding of this relevant issue.

REFERENCES

- Alastico, G. P. & Toledo J. C. de. (2012). Desempenho hospitalar: revisão bibliográfica sobre perspectivas e gestão. *Anais do Encontro Nacional de Engenharia de Produção*, Bento Gonçalves, Rio Grande do Sul, Brasil, 32.
- Azevedo, A. C. (1991). Avaliação de desempenho de serviços de saúde. *Revista de Saúde Pública*, 25(1), 64-71.
- Azevedo, A. C. (1993). Indicadores de qualidade e produtividade em serviços de saúde. *Revista Indicadores de Qualidade e Produtividade*, 1(1), 49-54.
- Barbieri, A.R. & Hortale, V. A. (2005). Desempenho gerencial em serviços públicos de saúde: estudo de caso em Mato Grosso do Sul, Brasil. *Caderno de Saúde Pública*, 21(5), 1349-1356.
- Bernard, R.R.S. (1999). The rise of non-financial measures. *Anais do Encontro da Associação Nacional dos Programas de Pós-Graduação em Administração*, Foz do Iguaçu, Paraná Brasil, 23.
- Biazzi, M. R. de, Muscat, A. R. N & Biazzi, J. L. de. (1999). Aperfeiçoamento de processo e melhoria de desempenho no setor público brasileiro. *Anais do Encontro Nacional de*

Engenharia de Produção, Salvador, Bahia, Brasil, 29.

- Campbell, S. M., Roland, M. O. & Buetow, S. A. (2000). Defining quality of care. *Social Science & Medicine*, 51 (11), 1611-1625.
- Carvalho Filho, M. de & Amorim, T. N. G. F. (2020). Inovação da gestão estratégica com a implantação do Balanced Scorecard. *Management Control Review*, 5(1), 19-33.
- Godoy, L. P., Perufo, L. D., Rodrigues, M. K. & Wegner, R. S. (2013). O monitoramento e controle dos processos de saúde através de indicadores de qualidade. *Anais do Encontro Nacional de Engenharia de Produção*, Salvador, Bahia, Brasil, 33.
- Grateron, I. R. G. (1999). Auditoria de gestão: utilização de indicadores de gestão no setor público. *Cadernos de Estudo*, 21, 1-18.
- Guimarães, V. M. & Costa, M. A. (2005). Fixação de padrões na atividade hospitalar. *Revista de Administração*, 4(2), 1-14.
- Loeb, J. M. (2004). The current state of performance measurement in health care. *International Journal for Quality in Health Care*, 16(1), i5-i9.
- Malik, A. M. & Teles, J. P. (2001). Hospitais e programas de qualidade no Estado de São Paulo. *Revista de Administração de Empresas*, 41(3), 51-59.
- Martins, C., Amorim, M. C. S., Cunha, E. N. & Ferraz, M. R. (2012). Comissões hospitalares: a produção de indicadores de gestão hospitalar. *Revista de Gestão em Sistemas de Saúde*, 1(1), 97-107.
- Miranda, L. C., Silva, J. G. de, Cavalcanti, R. F. V. & Fellows, C. P. (2001). Olhando para fora da empresa: combinando “Balanced Scorecard” com “Supply Chain Management” para considerar o fornecedor na medição de desempenho. *Anais do Encontro da Associação Nacional dos Programas de Pós-Graduação em Administração*, Campinas, São Paulo, Brasil, 25.
- Misoczky, M. C. & Vieira, M. M. F. (2001). Desempenho e qualidade no campo das organizações: uma reflexão sobre significados. *Revista de Administração Pública*, 35(5), 163-177.
- Odelina, C. C. & Santos, P. R. G. (2008). Avaliação de desempenho individual na administração pública federal: aspectos intervenientes no processo e nos resultados. *Revista Economia e Gestão*, 7(15), 10-30.
- Pessoa, T. R. & Kuroba, D. S. (2014). Gerenciamento de indicadores de desempenho em organizações hospitalares: em busca da maximização de resultados. *Caderno Saúde e Desenvolvimento*, 3(2), 37-48.
- Ramos, A. W. & Miyake, D. I. (2010). Desenvolvendo indicadores de produtividade e qualidade em hospitais: uma proposta de método. *Produto & Produção*, 11(2), 67-84.
- Shaw, C. (2015). Evaluating accreditation. *International Journal for Quality in Health Care*, 15, 455-456.
- Silva, I. L. & Drumond, R. B. (2004). A necessidade da utilização de sistema de custos e de indicadores de desempenho na administração pública. *Anais do Congresso USP de Controladoria e Contabilidade*, São Paulo, São Paulo, Brasil.
- Souza, A. A. de, Guerra, M., Lara, C. O., Gonide, P. L. R., Pereira, C. M. & Freitas, D. A. (2009). Controle de gestão em organizações hospitalares. *Revista de Gestão/USP*, 16(3), 15-29.

- Souza, N. C de, Souza, A. A. de & Cruz, N. G. (2011). Sistema de controle interno em organizações hospitalares. *Anais do Encontro Nacional de Engenharia de Produção*, Belo Horizonte, Minas Gerais, Brasil, 31.
- Vieira, D. K., Detoni, D. J. & Braum, L. M. S. (2006). Indicadores de qualidade em uma unidade hospitalar. *Anais do Simpósio de Excelência em Gestão e Tecnologia*, Resende, Rio de Janeiro, Brasil, 3.
- Williams, S. C., Schmaltz, S. P., Morton, D. J., Kosss, R. G. & Loeb, J. M. (2005). Quality of care in U.S. Hospitals as reflected by standardized measures, 2002-2004. *The New England Journal of Medicine*. 353, 255-264.
- World Health Organization. (2003). *Measuring hospital performance to improve the quality of care in Europe: a need for classifying the concepts and defining the main dimensions*. Report on a WHO workshop, Barcelona.