

Use of Balanced Indicators as a Management Tool in Nursing¹

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Objective: to develop a proposal for a nursing panel of indicators based on the guiding principles of Balanced Scorecard. Method: a single case study that ranked 200 medical records of patients, management reports and protocols, which are capable of generating indicators. Results: we identified 163 variables that resulted in 72 indicators; of these, 32 nursing-related: two financial indicators (patient's average revenue per day and patient's revenue per day by product used); two client indicators (overall satisfaction rate of patient with nursing care and adherence rate to the patient satisfaction survey); 23 process indicators, and five learning and growth indicators (average total hours of training, total of approved nursing professionals in the internal selection process, absenteeism rate, turnover rate and index of performance evaluation). Conclusion: although there is a limit related to the amount of data generated, the methodology of Balanced Scorecard has proved to be flexible and adaptable to incorporate nursing services. It was possible to identify indicators with adherence to more than one area. Internal processes was the area with the higher number of indicators.

Descriptors: Indicators; Health Management; Nursing; Biomedical Technology.

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Introduction

When adhering to quality and certification programs, institutions seek the hospital accreditation process, which aims to guarantee the quality of care provided to patients/clients through the monitoring of indicators⁽¹⁾. In addition to the certification issue, the use of indicators has been intensified to compare health care organizations and take them to a new level with competitive advantage⁽²⁾.

For its complexity and range, hospital services require from nursing continuous search for quality of care, which demand new management approaches and use of indicators that can provide measurement, monitoring and identification of opportunities for advancements⁽³⁾.

Although the use of indicators is extremely important for the management of services, in Brazil there is a gap related to indicators that represent the quality of nursing care in a hospital. In the early 1990s, the indicators used in North-American hospitals were adopted in Brazil with little adaptation and, years later, initiatives have emerged, aiming at a better adaptation to the Brazilian reality – among them, the publication of references for nursing indicators could be mentioned, as the *Manual do Núcleo de Apoio à Gestão Hospitalar* (NAGEH)⁽⁴⁾.

There is growing concern of managers from the nursing area regarding the construction and validation of indicators to measure the quality of care, which can be compared inside and outside the institution, revealing different contexts of professional practice. There is also a consensus that it is essential to choose appropriate evaluation systems and performance indicators to support the administration of services and to promote the decision-making process, minimizing uncertainties. However, to ensure the success and improvement of these assessments, it is necessary to adopt models that allow monitoring and measuring results⁽⁵⁾.

Considering this, we can deem as an alternative management tool Balanced Scorecard – Balanced

Indicators (BSC), which is a tool designed to contemplate a set of goals, divided into four areas – financial, client, processes, learning and growth – that can help an institution to achieve the balance between results, financial and non-financial measures⁽⁶⁾.

The indicators must be carefully selected and supported by the four areas which must allow the balancing, as well as the establishment of cause and effect relationships. Thus, it is possible to assess if the BSC demonstrating the vision of the organization⁽⁶⁾. Individually, balanced indicators reveal some of the requirements for the application of the model, and the “balanced” concept determines the method and is related to a balance in three situations: between financial and non-financial indicators, between internal (employees and processes) and external (shareholders and clients) components of the organization, and between result and trend indicators⁽⁶⁾.

Choosing BSC in this study is due to its flexibility, since it can be adjusted to various types of services with a defined goal. The selected measures allow for the dissemination of results to the employees, and can motivate all the staff. This tool has three essential purposes: it is a measurement system, a strategic management model and a communication instrument⁽⁶⁾. As it enables monitoring, the method identifies indicators that do not fit into the stipulated goal, which determines corrective actions for the continuous monitoring of the quality of care.

In the nursing area, specifically in hospital management, the use of BSC is little discussed. There are studies that have used this method to analyze public hospitals in Hong Kong⁽⁷⁾ and to evaluate information systems and health indicators in Spain⁽⁸⁾. Both researches indicate BSC as an applicable tool that assists the decision-making process.

Considering that the implementation of a model based on BSC is useful to hospitals and clinics to extend strategic management to the operational area, in particular to the nursing service, this study aimed to develop a proposal for a panel of nursing indicators based on the applicability of the Balance Scorecard guiding principles.

Method

This was a field methodological research, characterized as a single case study in a private hospital, located in the capital of the state of Paraná, which is part of Associação Nacional dos Hospitais Privados (ANAHP – Brazilian Association of Private Hospitals), with National Level III certification, and during the development of this research received the CANADIAN Certification. During the research, the hospital had 88 beds of high complexity, being 22 for critical care, seven surgical rooms and one emergency room. The nursing management model of the hospital is based on the Systematization of Nursing Care (SAE), aiming at an integral assistance to the patient through a Nursing Process focused on individualized and continuous care, seeking to identify and solve health problems.

Since it is a high complexity hospital, to make the research possible, we selected the environment of General Intensive Care Units (ICU) and Coronarian Intensive Care. The choice of these units was made due to the complexity of patients and criticality of the sector. The two units totaled 23 beds, divided into 11 General ICU beds and 12 of Coronarian ICU. The staff was composed of intensivists doctors, nurses with graduate programs in intensive therapy and nursing technicians, and also administrative assistants.

Two hundred (200) medical records of patients hospitalized in the ICUs were used as empirical basis, from July 2012 to May 2013, and Hospital Information System reports from all hospital areas. The collected data were grouped into 11 categories of analysis, one (1) related to Nursing Records and 10 related to information systems: performance evaluation, financial, safety, protocol, ombudsman, human resources, clinical nutrition, governorship, clinical pharmacy and technical audit.

The method followed four steps: (a) identification of data listed by nursing and creation of possible indicators, (b) survey of indicators already in use in the various sectors of the hospital, (c) correlation of indicators (created and surveyed) and possibility of adjustment in the structure of balanced indicators, and

(d) establishment of a panel with nursing indicators according to the four BSC areas.

For the first two steps data were collected until reaching the saturation point. For the collection and organization of data from a category called *Nursing Records*, a reading of medical records of the patients was performed to answer the following question: can this datum be transformed into an indicator? And for the categories related to the Hospital Information System, the data collected from different sectors were organized in a worksheet with name, description (the definition of the datum presented in institutional protocols) and technical note (relevant observation that was not included in the concept) of the datum.

After the initial collection, data from the 11 analysis categories were transferred to a "data classification" worksheet, in which were classified by category according to the following information: aggregated data, proposed indicator and collection periodicity. To aggregate and cross the data collected, we used criteria of similarity, information overlapping and purpose.

In the third step, the indicators related to the 11 analysis categories were arranged in a "proposed indicator" worksheet with name, respective calculation formula, purpose and origin. With this organization, it was possible to correlate the indicators found in the BSC broad categories: financial, client, processes, and learning and growth.

Stratification was performed based on the information presented in the "proposed indicator" worksheet, to answer questions concerning each one of the BSC areas. These are the respective questions by area⁽⁶⁾: financial area: "To satisfy our shareholders, which financial goals must be achieved?"; clients area: "To achieve our goals, which clients' needs we must meet?"; internal process area: "To satisfy shareholders and the market, in which business processes the company must have excellence?"; learning and growth area: "To achieve its future vision, how the company maintains the ability to change and improve?".

The course related to the first three steps of the method is presented in Figure 1.

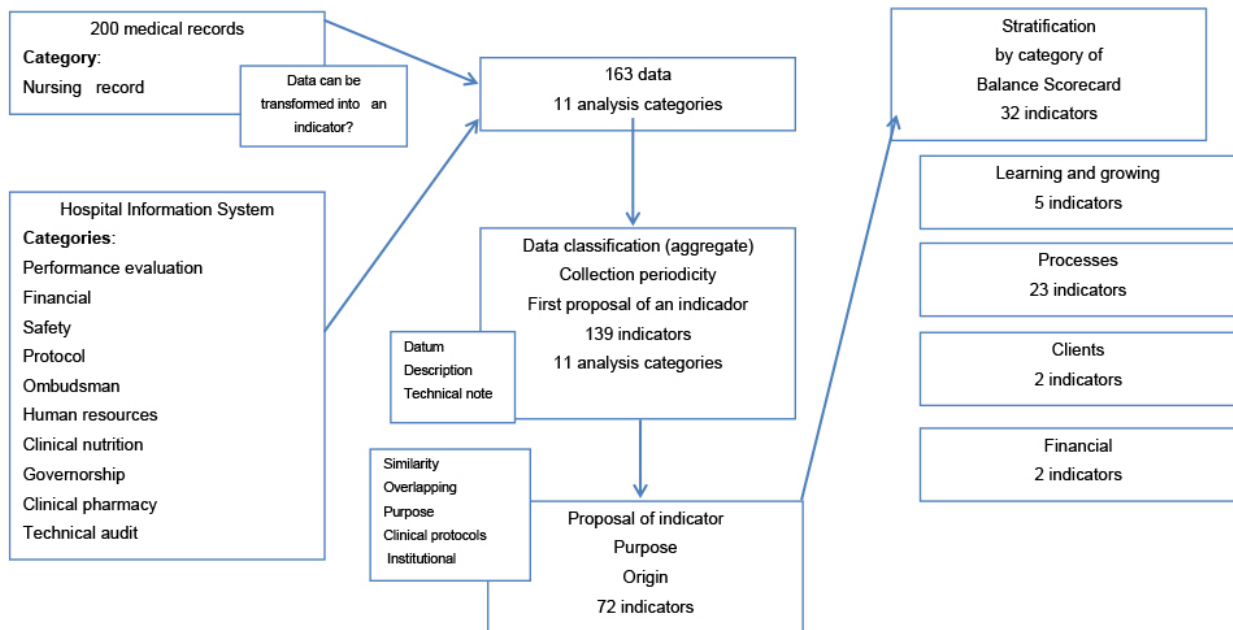


Figure 1 – Course of the method of organization, collection and analysis. Curitiba, PR, Brazil, 2013

For their complexity and coverage, some of the proposed indicators were classified into more than one area.

In the last step, we created a nursing panel of indicators, divided into the four BSC areas. The panel establishes outcome goals for each indicator based on the hospital history, in addition to opening space for the creation of an action plan for each indicator that is not adopted by the established goal. During this process, overlapping indicators and those related to the same purpose were removed.

The project was approved by the Research Ethics Committee of the Pontifícia Universidade Católica do Paraná (PUC-PR), under opinion 100,239/2012, and the access to data was authorized by the Regional Director of the institution.

Results

We found 163 variables, grouped into 11 analysis categories, which, after the evaluation process, were organized into 32 indicators related to nursing services (Table 1).

Table 1 – Distribution of variables collected and aggregated into indicators applicable to Balanced Scorecard and related to the nursing area, by analysis category. Curitiba, PR, Brazil, 2013

Categories	Collected variables	Aggregate variables	Generated indicators	Indicators applicable in areas of Balanced Scorecard	Nursing-related indicators
Protocol	27	24	22	22	0
Clinical nutrition	5	5	5	2	1
Performance	11	5	5	3	2
Financial	7	7	7	2	2
Ombudsman	8	8	8	7	2
Governorship	9	9	9	2	2
Technical audit	8	8	8	3	2
Safety	13	9	9	6	4
Clinical pharmacy	19	19	19	7	4
Human resources	32	32	27	7	5
Nursing records	24	20	20	11	8
Total	163	146	139	72	32

The panel of indicators (Figure 2) is composed of 23 indicators from the area of process (76%), two in the

financial area (6%), two in clients (6%) and five in the learning and growth area (16%).

GENERAL INTENSIVE CARE UNIT												
AREA OF INTERNAL PROCESS												
January	February	March	April	May	June	July	August	September	October	November	December	
FINANCIAL AREA												
January	February	March	April	May	June	July	August	September	October	November	December	
CLIENTS AREA												
January	February	March	April	May	June	July	August	September	October	November	December	
LEARNING AND GROWING AREA												
January	February	March	April	May	June	July	August	September	October	November	December	

Figure 2 – Panel of indicators. Curitiba, PR, Brazil, 2013

Discussion

Nursing indicators are an important and relevant support for a hospital because they are linked to most processes that involve assistance to patients, and are observed in primary screening procedures and in full assistance to critical patients, with management and operational range. Their follow-up, in a multi-professional way in different sectors, is essential to hospital routines and health care.

When one analyzes the data produced considering BSC areas, it is important to highlight the large amount of data that can be used as potential indicators. However, one verifies the inviability of a systematic analysis of data that were duplicated or non-systematically distributed in different sectors. Therefore it is very important to select a set of variables that mean quality for nursing management.

Although the indicators of *protocols* have direct influence on nursing actions and were responsible for the largest number of the variables collected, they were not directly related to the area, due to the alignment with the company's strategy that decides that more complex cases should have specific management, aiming at reduction of hospitalization time and optimization of the use of resources.

Managed protocols are tools designed for specific clinical conditions, aiming at the implementation of

assistential guidelines in the clinical practice and are important to unify and target the conduct of multi-professional staff. Monitoring clinical practices, through quality indicators, and the proposed intervention on non-conformities must be daily performed, from admission to discharge, serving as a warning to the non-compliance or non-adherence of managed protocol indicators⁽⁹⁾. Thus, for requiring more frequently monitoring, weekly meetings are held by the institution analyzed for the evaluation of specific protocols.

The data generated by the service of *hospital clinical nutrition* have an important role in the clinical evolution of the patient, a consequence of the increase of the number of dietitians and nutrition professionals working in multidisciplinary team in hospitals.

The proper and early introduction of an enteral nutritional therapy can reduce, at the same time, the incidence of infections and hospital stay; patients under intensive therapy have inadequacies related to nutritional support, and it is necessary to analyze the non-compliances that occurred between what was predicted and the actual calories and proteins given to the patient, and which factors contribute to its interruption.

Surveys reveal low percentage of adequacy concerning what was administered to meet the patients' needs, with values varying between 50% and 90%, proving the difficulty in providing real infusion of

enteral nutritional therapy, or similar to the predicted values. The enteral nutritional therapy is hampered by factors directly related to intensive therapy, such as hemodynamic instability, fast for examination and nursing procedures, and one of the most cited causes of interruptions of enteral nutrition has to do with nursing procedures⁽¹⁰⁾. Thus, we verified the need to keep in the nursing panel the indicator *Total of enteral diets prescribed versus infused diets*.

The services of performance evaluation, and financial, ombudsman, governorship, and technical audit services, although generating 102 managerial data were responsible for the inclusion of 10 indicators directly related to nursing.

Considering the data is used in hospital statistics, such as overall occupancy rate, hospital stay average, mortality rate, among others, in the *performance* category, only those that referred to the occupancy rate and average of hospital stay were kept as relevant to the nursing panel, since they are indicators used for validating the size of nursing staff. And also taking into account the lack of regulation of the ratio professional/beds for nursing care to the patient, resolution no. 293/2004, the Brazilian Federal Council of Nursing (COFEN) establishes minimum parameters for the size of staffs of nursing professionals in health institutions⁽¹¹⁾.

The Brazilian resolution determines that the calculation for a nursing staff must be based on the Patients Classification System, allocating nurses, technicians and assistants according to percentages determined for different types of care: minimum or self-care, intermediate, semi-intensive and intensive, as well as considering the occupancy rate of sectors. COFEN also established that the classification of patients for the implementation of nursing care is responsibility of nurses⁽¹¹⁾.

In the *financial* category, there was also a reduction for two (2) indicators: patient's average revenue/day and patient's revenue per day by product used. For the latter, nursing has an essential role, because it is responsible for handling and administrating most of inputs used in the hospital environment. Although one understands that nursing services do not directly influence the revenue growth, there is possibility of improving processes, which could reduce costs.

The *ombudsman* service improves the performance of nurses by enabling the assessment of their activities, according to the real needs of users. The follow-up of nurses through users' reports – given to the Ombudsman's office – is essential and should serve as

the basis for planning and development of actions to improve the quality of nursing care⁽¹²⁾. The ombudsman service in the institution under analysis serves as a communication channel, making more dynamic the treatment of information and the adoption of suggestions received.

The eight (8) variables produced by the sector involve customer satisfaction under various aspects, such as waiting time and personal presentation; however, the data were condensed into two (2) indicators of overall evaluation: the overall satisfaction rate of patients with nursing care and the adherence rate to the patient satisfaction's survey, which is used to confirm the satisfaction index is with the adequate return.

The structure *hospital governorship*, also called hospital hospitality, varies in intensity among different hospitals, mainly because it is a service with partial sedimentation; however, it is an industry that generates data that reveal whether the customer environment is safe and comfortable, regarding hygiene and cleaning, laundry, hospital linen, as well as solid waste management.

The hospital environment was already a concern of the scientific nursing pioneer, Florence Nightingale. Currently, hospital hospitality adds value, creating a pleasant, cozy and safe environment⁽¹³⁾. In this context, total volume of laundry per patient/day and the variation of the volume by category of waste are the two (2) indicators of this sector that were kept in the panel for being directly linked to nursing actions.

The current highlight *audit in health* has the control and regulation of the use of services and, especially in the private area, there is a focus on cost control and quality of assistance provided⁽¹⁴⁾. Audit in nursing aims to assess the assistance provided, recognition of shortcomings related to the reformulation of improvement plans for actions and financial analysis and reduction of cancellations⁽¹⁵⁾. Therefore, in this category the rate of pre-cancellation and total accounts for adjustments were kept in the nursing panel. Both are data from audits performed in nursing records, and thus totally dependent on nursing actions for a good result.

Other eight (8) indicators are equally distributed in safety services and clinical pharmacy. In the category *safety*, in which one can find variables that reveal the use of best practices, reducing and/or mitigating unsafe acts in the health care system⁽¹⁶⁾, we found data related to assistential protocols and control area of hospital infection. The four (4) indicators, directly related to nursing actions, are those that support interventions

related to the patient safety: infection density rate related to assistance in ICU, falls rate, medication error rate in adult ICU and compliance rate in filling of medical records.

The *clinical pharmacy* is a specialty whose practice is the responsibility of the professional pharmacist; however, it is understood that the judgment and interpretation of multi-professional data are necessary for the optimization of pharmacotherapy, because the record of the latter has its origins in data provided by medical and nursing staff⁽¹⁷⁾. In this sense, knowing the complexity of the whole process of management of the hospital pharmacy and assistance risks, four indicators were maintained, which are related to direct actions of nursing: follow-up rate to allergy risks, total of events per incorrect dispensation, adverse drug reaction rate and total of prescription mistakes.

The human resources department is responsible for the amount of 32 managerial data. In addition of having the role of a human resources department, the sector encompasses the concept of management of people and has a set of strategic and technical principles to attract, retain, promote, train and develop people. The creation of indicators for the evaluation of human resource management allows to detect efficiency and effectiveness of managerial actions and to improve work processes based on these evaluation indicators⁽¹⁸⁾.

At the institution analyzed, five (5) of the data depend on direct monitoring of the professional nurse to achieve the goal of keeping, training or developing employees: total average of training hours, total of approved nursing professionals in internal selection process, absenteeism rate, turnover rate and index of performance evaluation.

Based on the understanding that the *nursing record* is to use, in written language, all information related to the health care planning of the patient and, through these records, nursing actions are considered to define the proper care plan for the patient⁽¹⁹⁾ and that the latter are performed in an unsystematic way, lot of information is found. Assuming that many of the managerial nursing information would be available in the records, the indicators of this category were collected from the medical records of patients. The 24 variables initially collected were condensed into eight (8) indicators: effectiveness rate in carrying out systematization of nursing care, total of transfusion reactions in ICU, index of re-entry of patients in ICU, total of members required for the nursing care of patients admitted in ICU, adherence rate to the score for the follow-up of

multidisciplinary visit, phlebitis index in ICU, mortality rate in relation to APACHE II and pressure ulcer index in ICU.

Considering these variables, it was possible to identify the main data available in the hospital sectors that are likely to be used in the creation of balanced indicators, correlating them with nursing indicators and to the structure of balanced indicators. However, when one distributes different indicators in the BSC areas, an imbalance with majority identification in the nursing process was identified. This must be related to the fact that, when the indicator was aligned with the two areas, we established as criterion of choice the one with which nursing had greater action in the decision-making process. As an example, the cancellation indicator was aligned according to the financial and process area. In this case, nursing has a more intense action on the process of checking and registering medical records of patients and less intense action under the perspective of the financial area.

Conclusion

Although the data presented in this article came from a ICU, a place that features singular characteristics for nursing care, it is possible to select data available in several hospital sectors with potential use for the creation of balanced indicators and correlate them with nursing indicators.

When applying the BSC tool for the construction of nursing indicators, it was possible to notice that some of them had adherence to more than one area. In relation to nursing services and the indicators created, the area with a higher degree of importance is *internal processes*, including the largest amount of related indicators.

It is worth noting that the panel elaborated in the context of this article is already in use in the analyzed hospital and will be assessed by future research. In this sense, to align the indicators proposed in the strategic management of the institution, including even the operational area, is a way of contributing to the managerial knowledge and to combine administrative theoretical concepts with the nursing practice.

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