

Article

Key factors of healthcare performance management: A case study from Serbia

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Abstract: Measuring the performance of healthcare organizations has become a crucial yet challenging task, which is the focus of this study. The paper's primary goal is to identify the key factors that shape healthcare organizations' performance management systems in Serbia, which can serve as useful guidelines for implementing sustainable solutions. Additionally, the aim is to emphasize the importance of a broad implementation of performance measurement systems to facilitate strategy implementation and enhance organizational effectiveness. The empirical research involved an online survey of 280 respondents, including managers, executives, and operational staff from both private and public healthcare organizations in Serbia. Statistical analysis was conducted using SPSS 20. The study identifies key challenges, including the lack of a developed performance measurement system, weak support from information and management systems for performance improvement, and an organizational structure that does not support performance enhancement. Furthermore, it has been found that a deeper understanding of the essence of measurement significantly contributes to identifying problems in its application in the healthcare sector. It was also observed that the more challenges identified in the measurement process, the less favourable the perception of the flexibility and adaptability of the system.

Keywords: healthcare organizations; improvement; performance; measurement; key factors

1. Introduction

Crucial for any civilization's development and advancement is the healthcare sector. Ensuring the provision of high-quality medical services with the most efficient use of resources depends on the effective management of healthcare organizations. The study focuses on both public and private healthcare sectors. Recently, numerous challenges have been posed to the healthcare sector, such as rising costs, resource limitations, and growing environmental concerns (Cosenz et al., 2024). One of the fastest-growing areas of the economy in most developed countries is the healthcare sector. Large sums of money are invested by the Governments (and taxpayers) directly or indirectly in expectation of high-quality services from this sector. However, the performance of this sector is often identified by long waiting times, inefficiency, low productivity, stressed medical staff, and patient dissatisfaction (Purbey et al., 2007). The healthcare system is comprised of a complex set of entities, activities, and processes, fundamentally rooted in clinical processes, involving a wide range of participants with different requests, priorities, and evaluation criteria (Kanji and Yui, 1997).

Today, there is an increasing need to develop healthcare organizations' effective management and control systems due to internal and external pressures. The internal one is primarily connected with the growing complexity of processes that call for continuous consciousness of the resources use efficiency and effectiveness in achieving intended objectives. On the other hand, external pressure arises from various phenomena, such as the healthcare sector's competitive environment, unpredictable health issues (like the COVID-19 pandemic), or imposed limitations and obligations from regulatory bodies (above all regarding the public healthcare organizations) (Ippolito et al., 2023). Therefore, corporate governance mechanisms in healthcare organizations focus on operational issues and performance evaluation (Achiro et al., 2024).

“Healthcare organizations today face a myriad of challenges as they try to adapt to demands for better quality and reduced costs” (Milojević et al., 2024). In both the private and public sectors healthcare organizations are encouraged to implement efficient performance measurement systems that can monitor the achievement of specified objectives in real-time, enable quick adjustment of these objectives when necessary, and check how they interact. However, it should be noted that in complex organizations the performance measurement systems' efficiency and effectiveness are very difficult to guarantee. Information systems capable of supporting the tracking of effective and efficient performance measurement are the characteristics that a performance measurement system should possess. The accounting information system in the organization should provide all necessary information for decision-making (financial and managerial accounting) (Knežević et al., 2012), and they are important for ensuring sustainable operation (Srebro et al., 2021). “Management Information System” also mediates the relationship between strategic management accounting and sustainability performance (Werastuti et al., 2023). In this context, the importance of adequate financial literacy of healthcare organization managers is highlighted (Gačić et al., 2023).

The study focuses on identifying the key factors that model the healthcare organizations' performance management systems in Serbia, providing guidelines that may be of significant benefit for implementing sustainable solutions and highlighting the relevance of this topic. Additionally, the study aims to emphasize the importance of the broad application of performance measurement systems to facilitate strategic initiatives implementation and improve overall organizational performance. Special emphasis is placed on identifying challenges in implementing these systems in the specific context of healthcare institutions in Serbia, as well as analyzing how effective performance management can contribute to better resource allocation, increased transparency and accountability, and improved service quality.

Measuring performance is a quantitative tool, such as a rate, ratio, or percentage, indicating an organization's performance concerning a specific process or outcome (JCAHO, 2002). Policy, administrative management, and professional service are three domains based on which a healthcare organization can be described (Kouzes and Mico, 1979). Different domains have different requirements for management control and performance measurement. Regarding healthcare organizations, indicators such as the number of treated patients, the number of performed diagnostic procedures, the number of days a patient spent in the hospital, and the amount of medication

administered can be viewed as process measures. Metrics like mortality rate, complication rates, and average lifespan after surgery are examples of outcome measures (Iablonskii and Fedotov, 2015).

Measurement cannot be viewed as a neutral activity since it affects all of the involved causing significant anxiety and frustration for the ones measured, the ones conducting the measurements, and those requesting data for various purposes. Performance measurement is important from the perspective of different stakeholders, enabling healthcare organizations to gain a comprehensive overall assessment of their business excellence. Only a portion of these opportunities would be identified if measurements were made from the perspective of a single stakeholder. There is scarce agreement on the philosophy of measurement, what is to be measured, how to analyze the data, or how to report the data; and ultimately, questions remain about the value of measurement itself (Loeb, 2004). Performance measurement in healthcare organizations is still an unsettled concern. A performance measurement system should possess specific characteristics, such as measuring performance from multiple and interconnected perspectives, being user-friendly, being affected by changes in the external and internal environment of the organization, tracking progress, aligning with its strategy, and being based on key success factors (performance drivers). The survey questions were defined in line with this discourse.

For healthcare activities organized for profit, profit is undoubtedly one of the main goals. A healthcare institution will also strive toward other, less tangible goals. For example, concerning employees, the goal might be to be a good and fair employee. Non-financial measures (such as service user loyalty and employee satisfaction) are important because they complete the picture of the observed healthcare organization's performance by filling the gaps left by financial accounting. This more complete picture provides information necessary for achieving the organization's strategic objectives.

In line with the research's subject and goal, several research questions have been defined in this study:

- How do challenges in the process of performance measurement affect the perception of system flexibility and adaptability?
- How does understanding the essence of performance measurement contribute to identifying implementation problems?
- How do healthcare sector organizations respond to feedback on performance?
- What are the key challenges organizations face when implementing measurement systems for performance in the healthcare sector?

This study contributes by filling the gap in existing research, specifically focusing on the performance measurement of healthcare organizations, offering valuable insights into current practices, and highlighting potential areas for improvement. Second, the results provide insights into the specifics of performance measurement systems in healthcare organizations in Serbia.

The study consists of five sections. Following the introductory considerations, there is a literature review explaining the development processes of performance measurement systems in healthcare institutions, frameworks for their measurement, and the features of good performance measurement systems, emphasizing the importance of performance indicators. The third section explains the research

methodology. The results are presented in the fourth section, and the conclusions and research limitations are in the final section.

2. Literature review

Performance management and measurement represent a field of scientific and practical interest focusing on the planning and implementation of appropriate tools and devices for measuring, monitoring, and evaluating organizational outcomes (i.e., results) and the fundamental methods (i.e., means) used to achieve them. There are three phases within this system: the development of performance indicators, the measurement framework, and the management framework. The healthcare sector and related organizations have not been exempted from implementing performance management and measurement systems directed to supporting decision-makers in achieving desired results at different levels (Di Falco et al., 2024). These systems have become increasingly connected to information and communication technologies, and more broadly, to information systems (Geddes, 2020).

Bjegovic-Mikanovic et al. (2019) state that the health insurance system provides coverage for almost the entire population (98%) in the Republic of Serbia and life expectancy at birth increased slightly in recent years. Still, it remains, for example, around 5 years below the average across European Union countries. The state exercises a strong governance role in Serbia's social health insurance system. Strategic approaches are necessary to stimulate reforms and enhance the population's health culture by implementing precisely defined strategies (Vukosavljević et al., 2023). The country lacks a transparent and comprehensive system for assessing the benefits of healthcare investments and determining how to pay for them (Bjegovic-Mikanovic et al., 2019). Financing the healthcare system in the Republic of Serbia involves a combination of public finances and private funds. The key directions for improvement include better billing regulation, increased participation of private insurance, and greater incorporation of the private sector to ensure more stable healthcare financing (Anđelić et al., 2023).

The process of performance measurement supports the management of a company in achieving the goals set in strategic planning. By defining the key success factors and associated critical performance indicators, performance measurement verifies the gap between planned goals and achieved outcomes, informing relevant bodies to enable them to evaluate performance and, if needed, implement improvement actions (Sardi et al., 2024).

Keegan et al. (1989) identify three different steps in a performance measurement system development:

- a) defining the company's strategic goals and deciding how they can be translated into divisional goals and individual managerial acts;
- b) deciding what to measure; and
- c) embedding the performance measurement system into management thinking, possibly through the budgeting process.

Various authors have proposed various frameworks for organizational performance measurement. Some important performance measurement frameworks are (1) Balanced performance measurement matrix (Keegan et al., 1989), (2)

Performance measures for time-based competition (Azzone et al., 1991), (3) Performance pyramid system (Judson, 1990; Lynch and Cross, 1991), (4) Balanced scorecard framework (Kaplan and Norton, 1992), (5) Brown's input, processes, outputs and outcomes framework (Neely, 2002) and (6) Performance Prism (Neely et al., 2001).

Healthcare staff are under significant demand to control costs due to increasing healthcare expenditures attributed to an ageing population, modern diseases, and expensive biomedical technology (Aletras et al., 2007). Simultaneously, healthcare organization managers are strongly pushed to deliver highly efficient and effective healthcare services (Weir et al., 2009). Performance measurement is applied in modern healthcare organizations, using key performance indicators (KPIs) based on existing or specifically collected data as an evidence-based approach to holistic healthcare organization management,

Performance indicators can be clinical and non-clinical. Most non-clinical performance indicators are divided into one of seven categories (Bergeron, 2018):

- Capacity and utilization—provide an overall view of how efficiently and effectively the organization's resources are being utilized, which management can use to predict financial performance.
- Capital structure—assesses the organization's ability to bear debt (borrowing capacity).
- Liquidity—evaluates the organization's ability to cover short-term debt.
- Mix of the patient and payer—reflecting the source and nature of third-party reimbursements.
- Pricing strategies—help management assess relative market competitiveness.
- Productivity and efficiency—emphasize the root causes of financial performance.
- Revenues, expenses, and profitability—assess the organization's potential to generate revenues greater than costs, whether in a for-profit or non-profit structure.

In recent decades, interest in assessing the performance of healthcare structures has increased. Today, the ability to assess and predict healthcare performance is crucial for proper investment planning and resource allocation. In this context, tools for KPIs have been developed to assess the performance of healthcare structures in terms of processes, organization, costs, finances, and outcomes. Managers often rely on KPIs to support decision-making, providing process, organizational, outcome, cost, and financial indicators (Lečić-Cvetković et al., 2024). They analyze KPIs to determine the overall impact of these variables on healthcare performance, usually relying on human judgment or software that provides synthetic dashboards (Muriana et al., 2016). Designing an effective performance evaluation strategy is essential to align the activities of healthcare organizations with their strategic direction, involving a continuous cyclical process of data collection, analysis, and action at varying levels of the labor force, healthcare, and the organization providing the services (Lizarondo et al., 2014).

As Domanović (2013) points out, "Effective performance measurement systems inevitably become a condition for companies' survival in today's dynamic and highly turbulent environment." Performance measurement stands out as an important mechanism for organizational accountability in industrialized countries. The

healthcare environment has become more competitive, and healthcare leaders need to improve their ability to manage resources and reduce costs. Faced with inadequate reimbursements, increased pricing competition, and a growing shortage of skilled staff, healthcare organizations are required to improve their financial performance for broader access to capital and remain competitive. For this purpose, a properly designed performance measurement system is needed.

A crucial aspect of effective performance management is the so-called “tone at the top.” The integrity of the company’s managers defines how effectively it is managed and shapes stakeholders’ perceptions of the likelihood of success. Research shows that the actions of directors can jeopardize the survival of companies (Bhuiyan et al., 2024; Larcker and Tayan, 2016). Interestingly, studies reveal that 34% of CEOs deceive the board or shareholders due to misconduct related to driving under the influence, undisclosed criminal records, or falsified credentials; 21% engage in unsuitable relationships with subordinates, contractors, or consultants; and 16% misuse corporate resources. Despite this, they are rarely discharged, with only appropriate limitations on their power imposed, which impacts corporate policy and results (Bhuiyan et al., 2024). Specifically, in healthcare organizations, several studies have observed that top management has a crucial but restricted impact on economic outcomes, as resource spending is mainly linked to clinical decisions (Naciti et al., 2022).

To maximize clinical services while ensuring a profitable mix healthcare organizations need to routinely monitor their network of medical staff. The assessment is required to investigate the community’s changing demographics and needs, as well as the product mix offered by competitors. Information on community requirements may come from community leaders, board members, employees, and physicians as medical staff. A performance measurement system will ensure that the organization provides high-quality services cost-effectively to meet users’ needs (Chen et al., 2012). However, in the public service sector, it is complicated to measure performance as it involves many stakeholders and numerous factors affecting performance in the healthcare sector such as clinical processes, patient satisfaction, cost control, human resource-related factors, and others. Administrators of healthcare organizations must have timely, valid, and understandable financial information that enables them to make operational decisions in response to the changing healthcare environment. Overall indices reflecting hospital financial performance dimensions and simplifying information into financial indicators are needed to aid decision-making (Glandon et al., 1987).

Concerns about escalating healthcare costs have led to significant changes in how healthcare organizations and professionals are reimbursed for their services. Capitation, a fixed-fee payment to healthcare providers for providing care when needed, represents a significant change in the healthcare industry. The role of costing based on activity, lifecycle, and value chain analysis is becoming increasingly important as payment for healthcare services shifts from fee-for-service to capitation arrangements between insurance companies and healthcare providers. Healthcare organizations that design and implement accurate cost accounting and evaluation systems will improve their ability to compete successfully in this fast-altering environment. Improving healthcare performance has become a necessity to optimize

resources in an area where they are limited. Particularly noteworthy is the costing application based on activity (ABC), used for over 30 years to allocate costs and provide decision-making information (Niñerola et al., 2021). Improving performance involves various measures, and it is crucial to consider the accessibility of these services since if the services are not affordable, even high-quality services may not be fully accepted.

A critical review of the consulted literature suggests that a good performance measurement system should demonstrate the following features:

- 1) Performance measurement from multiple and interconnected perspectives,
- 2) Valid, reliable, and easy to use,
- 3) Integrated with the organization's values and strategy,
- 4) Changes sensitive regarding an organization's external and internal environment, containing leading performance measures,
- 5) Enable comparison and progress tracking,
- 6) Be based on critical success factors or performance drivers.

The literature on performance measurement in healthcare organizations is rich in debates about the sensitivity of performance measures (Cinaroglu and Zengul, 2019). The sensitivity of measures involves two aspects: one concerning objective measures and the other subjective measures. Managers' decisions regarding performance evaluation led to changes depending on the measures being objective or subjective. Objective and subjective measures should be equally weighted in performance evaluation (Dai et al., 2018).

In the business world, non-financial measures have been increasingly accepted. Nevertheless, their usage in the healthcare industry remains limited. The impact of non-financial measures (efficiency, productivity, and quality) on the financial performance of for-profit healthcare organizations is an important issue when considering performance measurement systems. Ultimately, various non-financial measures have different strengths and weaknesses. The value of non-financial measures does not lie in any single measure but in creating a comprehensive set of measures closely aligned with the organization's strategy. The selection of non-financial measures, their combination with financial measures to create useful performance metric mixes, and the task of assessing their role in value generation poses a significant challenge (Vélez-González et al., 2011).

3. Materials and methods

The empirical research was conducted using a survey method applied to a selected sample. The questionnaire was distributed to 350 individuals, with 280 responses received, resulting in a response rate of 80%. The sample consisted of 280 respondents, including managers/executives and operational staff of both profit-oriented and non-profit healthcare organizations operating in the Republic of Serbia. For this purpose, a questionnaire was prepared and distributed online.

The study involved 280 respondents, of whom 184 (65.7%) were male and 96 (34.3%) were female. As shown in **Table 1**, the largest group of respondents, 97 (34.6%), were aged between 35 and 44, followed by 79 (28.2%) who were under 35 years old, 72 (25.7%) were between 45 and 54 years old, and the smallest group was

over 54 years old (11.4%). Regarding education, the majority of respondents held a bachelor’s degree 116 (41.4%), followed by those with a master’s degree 90 (32.1%), 56 (20.0%) had only a high school education, and the smallest group held a doctorate 18 (6.4%). A total of 195 (69.6%) respondents were in operational positions, while 85 (30.4%) were in managerial positions.

Table 1. Characteristics of the research sample.

Characteristic	N (%)
Gender	
Male	184 (65.7)
Female	96 (34.3)
Age Structure	
Under 35 years	79 (28.2)
35–44 years	97 (34.6)
45–54 years	72 (25.7)
Over 54 years	54 (11.4)
Education	
High School	56 (20.0)
Bachelor’s degree	116 (41.4)
Master’s degree	90 (32.1)
Doctorate	18 (6.4)
Job Position	
Managerial	85 (30.4)
Operational	195 (39.6)
Familiarity with Performance Measurement Systems	
Yes	58 (20.9)
Yes, but not completely	116 (41.9)
No knowledge of it	103 (37.2)

Source: Author.

The indicators used in the survey were carefully selected based on relevant literature and expert consultations in the field of healthcare performance measurement.

In this study, data were analyzed using descriptive statistical methods. Responses to the questionnaire items were presented as frequencies, representing the number of respondents who provided a specific answer, and as percentages of those responses. Pearson’s correlation was used to examine the relationships among numerical variables (Hung et al., 2017). Cronbach’s alpha coefficient was used to measure the reliability and internal consistency of variables (Izah et al., 2023). Linear regression was applied to assess the relationship between independent variables and the dependent variable (Skrepnek, 2005). The data analysis was conducted using the SPSS software (IBM SPSS Statistics), version 20. Based on the empirical results of the research, the current state was assessed, and opportunities for improving the performance measurement system in healthcare organizations were identified.

4. Results

The results shown in **Table 2** show that 41.9% (116) of respondents were partially familiar with the performance measurement system in their organization, while 20.9% (58) were fully familiar with it. The remaining 37.2% (103) of respondents stated that they did not know this system. These results indicate that a significant portion of respondents are not fully informed about how the performance measurement system functions in their organization.

Table 2. Recognition of the performance measurement system.

Features	N (%)
Familiarity with the Performance Measurement System	
Yes	58 (20.9)
Yes, but not completely	116 (41.9)
No knowledge of it	103 (37.2)

Source: Author.

Table 3. Distribution of respondents' answers on key characteristics of a good measurement system, measures of key performance, and familiarity with performance measurement frameworks.

Features of a Good Performance Measurement System	Yes N (%)	No N (%)
Measures performance from multiple and interconnected perspectives	89 (31.8)	191 (68.2)
valid, reliable, and easy to use	141 (50.4)	139 (49.6)
linked to the organization's values and strategy	158 (56.4)	122 (43.6)
change-sensitive in the organization's external and internal environment, containing leading performance measures	172 (61.4)	108 (38.6)
Enables comparison and progress tracking	174 (62.1)	106 (37.9)
Is based on key success factors or performance drivers	199 (71.1)	81 (28.9)
Key Performance Measures	Yes N (%)	No N (%)
Efficiency	136 (48.6)	144 (51.4)
Quality	146 (52.1)	134 (47.9)
Rate of return	51 (18.2)	229 (81.8)
Productivity	124 (44.3)	156 (55.7)
Solvency ratio	55 (19.6)	225 (80.4)
Familiarity with Performance Measurement Frameworks	Yes N (%)	No N (%)
Measurement matrix of balanced performance	44 (15.7)	236 (84.3)
Performance measures for time-based competition	49 (17.5)	231 (82.5)
Pyramid system of performance	71 (25.4)	209 (74.6)
Framework of balanced scorecard	57 (20.4)	223 (79.6)
Framework of Brown's input, processes, outputs and outcomes	0 (0.0)	280 (100.0)
Prism of Performance	41 (14.6)	239 (85.4)
None of the above are familiar to me	0 (0.0)	280 (100.0)

Source: Author.

Respondents were then asked to select from a list of characteristics they believe a good measurement system should have, the significant non-financial performance measures, and to identify the performance measurement frameworks they were

familiar with. As shown in **Table 3**, the characteristics of a good performance measurement system most frequently identified by respondents as significant were being appertained to key success factors or performance drivers (71.1%), enabling comparison and progress tracking (62.1%), and sensitivity to changes in the external and internal environment (61.4%). This indicates that respondents recognize the importance of a system that allows tracking key success indicators, provides the ability to analyze progress, and quickly responds to changes within and outside the organization. The non-financial performance measures most frequently identified by respondents as significant were quality (52.1%), efficiency (48.6%), and productivity (44.3%). These results suggest that respondents acknowledge the importance of non-financial measures related to service quality, as well as efficiency and productivity of work. The performance measurement frameworks that respondents were most familiar with were the Performance Pyramid System (25.4%) and the Balanced Scorecard Framework (20.4%). This indicates that, although there is some level of recognition of these frameworks, most respondents are not familiar with the most important international performance measurement tools, which may suggest a need for additional education in this area.

Respondents evaluated their degree of agreement with each of the statements regarding attitudes toward performance measurement in healthcare organizations using a Likert scale (Emerson, 2017) ranging from 1 (strong disagreement) to 5 (strong agreement). The percentage distribution of responses, as well as the average value for each of the items, is shown in **Table 4**. The mean values ranged from a minimum of 3.28 to a maximum of 3.80, indicating that participants mostly agreed with the statements or held a neutral stance. The statements in this questionnaire were grouped into four domains based on thematic similarity.

Table 4. Degree of respondents' agreement with the given statements.

	1 N (%)	2 N (%)	3 N (%)	4 N (%)	5 N (%)	Mean ± SD
Nature of Performance Measurement						
Measurement is not a neutral activity	18 (6.4)	24 (8.6)	102 (36.4)	79 (28.2)	57 (20.4)	3.48 ± 1.104
The success of performance measurement does not depend solely on the chosen performance indicator	10 (3.6)	11 (3.9)	93 (33.2)	97 (34.6)	69 (24.6)	3.73 ± 0.993
The success of performance measurement depends on those who evaluate performance	16 (5.7)	30 (10.7)	95 (33.9)	92 (32.9)	47 (16.8)	3.44 ± 1.069
Performance measurement in healthcare organizations is still an unresolved issue	9 (3.2)	13 (4.6)	98 (35.0)	89 (31.8)	71 (25.4)	3.71 ± 1.000
Challenges of Measurement in Healthcare Organizations						
There is little agreement on what to measure, how data should be analyzed, or how to present data	4 (1.4)	20 (7.1)	88 (31.4)	102 (36.4)	66 (23.6)	3.74 ± 0.947
A performance measure is a quantitative tool, such as a rate, ratio, or percentage, indicating the organization's performance regarding a particular process or outcome	3 (1.1)	18 (6.4)	95 (33.9)	101 (36.1)	63 (22.5)	3.73 ± 0.919

Table 4. (Continued).

	1 N (%)	2 N (%)	3 N (%)	4 N (%)	5 N (%)	Mean ± SD
Sensitivity of the Measurement System to Changes						
The performance measurement system needs to be highly sensitive to changes in the organization's external environment	5 (1.8)	16 (5.7)	95 (33.9)	95 (33.9)	69 (24.6)	3.74 ± 0.954
The performance measurement system needs to be highly change-sensitive regarding the organization's internal environment	7 (2.5)	11 (3.9)	81 (28.9)	114 (40.7)	67 (23.9)	3.80 ± 0.934
Issues in Implementing the Performance Measurement System						
Developed performance measurement system does not exist in my organization	23 (8.2)	28 (10.0)	96 (34.3)	71 (25.4)	62 (22.1)	3.43 ± 1.177
More attention is paid to non-financial compared to financial performance in my organization	30 (10.7)	34 (12.1)	95 (33.9)	69 (24.6)	52 (18.6)	3.28 ± 1.210
My organization has weak support for information systems for performance management	15 (5.4)	27 (9.6)	96 (34.3)	82 (29.3)	60 (21.4)	3.52 ± 1.094
There is weak management support for performance improvement in my organization	15 (5.6)	39 (13.9)	87 (31.1)	71 (25.4)	68 (24.3)	3.49 ± 1.158
My organization's structure does not support performance improvement	26 (9.3)	34 (12.1)	94 (33.6)	76 (27.1)	50 (17.9)	3.32 ± 1.175

Source: Author.

The overall score for each domain was obtained by summing the responses to the statements that belong to that domain, while the total score for the entire questionnaire was calculated by summing the scores of all statements. The average value for the domain Nature of Performance Measurement was 14.36 ± 2.927 (out of a maximum of 20), indicating that respondents generally recognize the essential aspects of performance measurement, including the subjectivity of this process. This value suggests a solid level of awareness of the significance of performance measurement but also points out that there is room for further enhancement in understanding or applying certain concepts to make the system more efficient and objective. The average value for the domain Issues of Measurement in Healthcare Organizations was 7.46 ± 1.604 (out of a maximum of 10), indicating that respondents recognize the existence of significant challenges in performance measurement in the healthcare sector. This value suggests that unresolved issues still exist and a lack of consensus regarding what exactly should be measured and how to interpret the data, although respondents are aware of these difficulties. For the domain Sensitivity of the Measurement System to Changes, the average value was 7.53 ± 1.613 (out of a maximum of 10), suggesting that most respondents believe the system is relatively flexible and capable of responding to changes, which is crucial for its success in the healthcare sector. Based on the average score for the domain Issues in Implementing the Performance Measurement System, which is 17.05 ± 4.682 (out of a maximum of 25), it can be observed that respondents recognize significant practical challenges in applying the performance measurement system in healthcare organizations. The challenges they highlight include the lack of a developed performance measurement system, weak support from information systems and management for performance improvement, as well as an organizational structure that does not support performance improvement. Regarding reliability, Cronbach's alpha values indicate that different

domains of performance measurement have varying levels of internal consistency. The highest value, 0.864, was observed for challenges in implementing the performance measurement system. The nature of performance measurement, challenges in healthcare organizations, and sensitivity of the measurement system to changes have moderate Cronbach’s alpha values (ranging between 0.629 and 0.657), indicating a corresponding level of consistency in these domains (Table 5).

Table 5. The mean values, standard deviations, and Cronbach’s alpha coefficients for analyzed variables.

Domain	Mean ± SD	Cronbach’s alpha
Nature of Performance Measurement	14.36 ± 2.927	0.657
Challenges of Measurement in Healthcare Organizations	7.46 ± 1.604	0.645
Sensitivity of the Measurement System to Changes	7.53 ± 1.613	0.629
Challenges in Implementing the Performance Measurement System	17.05 ± 4.682	0.864

Source: Author.

Table 6. Correlations between domains.

Domain	Nature of Performance Measurement	Issues in Measuring in Healthcare Organizations	Change- Sensitivity of the Measurement System to	Issues in Implementing the Performance Measurement System
Nature of Performance Measurement	1			
Challenges in Measuring in Healthcare Organizations	$r = 0.572^*$	1		
Sensitivity of the Measurement System to Changes	$r = 0.397^*$	$r = 0.495^*$	1	
Challenges in Implementing the Performance Measurement System	$r = 0.229^*$	$r = 0.272^*$	$r = 0.270^*$	1

* < 0.001. Source: Author.

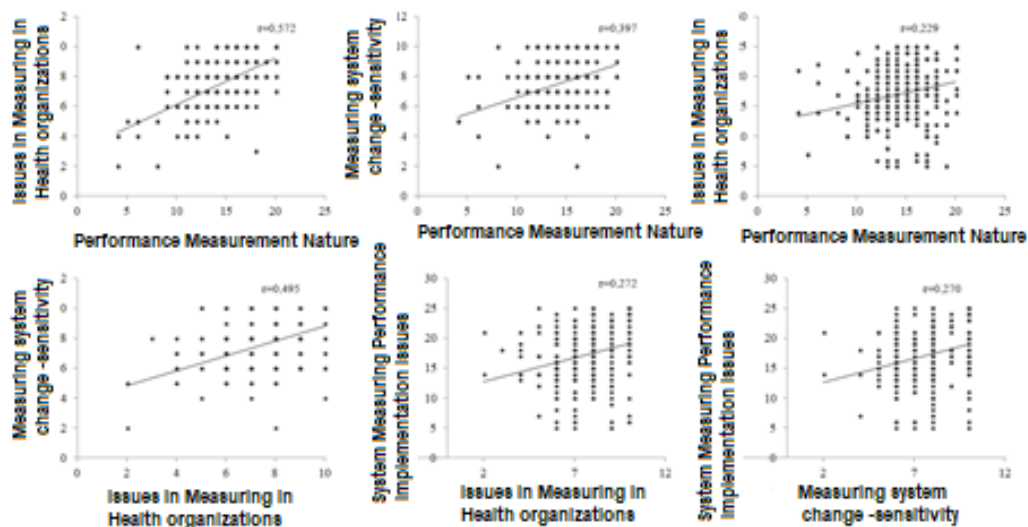


Figure 1. Graphical representation of the correlation between domains.

Source: author, Table 5.

The outcomes presented in the next table were obtained using Pearson correlation analysis. **Table 6** shows the correlations between different performance measurement domains graphically represented in **Figure 1**. As can be seen, stronger correlations, such as the one between the nature of performance measurement and the issues of measurement in healthcare organizations ($r = 0.572$), suggest that a deeper understanding of the essence of measurement significantly contributes to identifying problems in its application in healthcare organizations. Similarly, the connection between measurement challenges and the sensitivity of the system to changes ($r = 0.495$) indicates that healthcare organizations facing greater challenges in measurement more frequently recognize the need to adapt to changes in both external and internal environments. In contrast, weaker correlations, such as those between the nature of measurement and implementation challenges ($r = 0.229$) or between sensitivity to changes and implementation challenges ($r = 0.270$), indicate that these areas are related but less directly influence each other. These results suggest that while understanding the essence of measurement and its challenges can be useful, it does not guarantee easier implementation of the performance measurement system, meaning that separate strategies need to be developed to effectively address practical issues in implementation.

The outcomes in the next table were derived through multiple linear regression analysis. The results shown in **Table 7** illustrate how respondents' perception of the performance measurement nature and the issues in performance measurement influence their perception of the changes in the sensitivity of the system in healthcare organizations. The way respondents perceive performance measurement—how it is defined, its comprehensiveness, and how it is implemented—affects how they view the ability of healthcare organizations to respond to changes in the environment ($\beta = 0.169$, $p = 0.007$, 95% CI: 0.025–0.162). On the other hand, respondents' perception of challenges in performance measurement shows a significant and much stronger impact on the perception of system sensitivity ($\beta = 0.398$, $p = 0.000$, 95% CI: 0.275–0.524). This result indicates that the greater the challenges recognized by the respondents in the performance measurement process, the less favourable their perception of the system's flexibility and adaptability. Overall, these two variables explain 25.9% of the variance in the perception of system sensitivity.

Table 7. The impact of the nature of performance measurement and issues in healthcare organizations on the sensitivity of the system to changes.

	<i>B</i>	β	<i>p</i>	95% Confidence Interval
Nature of Performance Measurement	0.093	0.169	0.007	0.025–0.162
Challenges in Measuring in Healthcare Organizations	0.400	0.398	0.000	0.275–0.524

Source: Author.

The results indicate that 99 respondents (35.4%) believe that their organization regularly implements initiatives for performance improvement, while 94 respondents (33.6%) think that this is not the case, and 89 (31.1%) are unaware of it. Regarding the monitoring of the success of these initiatives, 85 respondents (30.4%) believe it is

done very often, while the majority, 190 respondents (67.9%), state that success is monitored annually, and only 5 respondents (1.8%) are unaware of this. These results suggest that most respondents recognize activities related to monitoring performance improvement initiatives, with success tracking mainly occurring on an annual basis. When it comes to employee involvement in work improvement processes, 49 respondents (17.5%) report being fully involved, while the majority, 134 respondents (47.9%), participate partially, and 97 respondents (34.6%) are not involved at all. This data suggests that most respondents have a certain level of involvement in improvement processes, but a significant percentage of employees are still not actively engaged in these processes. Regarding the organization's readiness to implement changes based on feedback, 86 respondents (30.7%) considered the organization fully prepared, while 120 respondents (42.9%) assessed partial readiness, and 74 respondents (26.4%) reported minimal readiness. These results indicate that most respondents recognize the organization's willingness to respond to feedback, although there is considerable room for improvement.

5. Discussion

Some of the articles can be highlighted for their significance for the observed issue. Competition influenced how organizations responded to performance feedback. Hong et al. (2024) stress that competition influences how organizations respond to performance feedback. Speziale (2015) elaborates that organizational culture requires rigorous measurements of value: namely, outcomes and costs. According to Li and Benton (1996), previous research on performance measures in the healthcare industry primarily focuses on either internal metrics related to cost and quality or external indicators such as financial health and customer satisfaction. Lega et al. (2013) deal with considering whether management is essential to improving the performance and sustainability of healthcare systems and organizations. Results indicate that there is a clear and consistent link between medical engagement and performance and positive correlations have been found between clinical and economic performance.

Finally, the study answered the research questions posed. Regarding the first research question, it was observed that organizations facing greater challenges in performance measurement have a less favorable perception of the flexibility and adaptability of the system. This means that challenges hinder the system's ability to react quickly and effectively to changes, leading to a perception that the system is not flexible enough. It is necessary to further examine whether these challenges are technical, procedural, or organizational, but the general perception is that their impact reduces confidence in the system's capacity to adapt to changes.

Regarding the second research question, it was observed that a deeper understanding of the essence of measurement helps identify problems during the implementation of the system. Although understanding alone does not guarantee easier implementation, it allows organizations to recognize potential obstacles and challenges before they arise, thus creating a better foundation for adapting and improving the performance measurement system. Understanding is crucial for identifying problems, but additional strategies are needed to address them.

Concerning the third research question, it was found that there is a broad recognition of organizations' readiness to respond to feedback, but also a significant opportunity to improve this process. This implies that while organizations are open to change, their responses to feedback are not always prompt or effective. Developing new strategies for more effective responses to feedback could include implementing continuous performance monitoring systems, adapting procedures, and establishing clearer channels for feedback and action. This also indicates the need for separate strategies that will enable the effective resolution of practical issues during the implementation of the performance measurement system.

Addressing the fourth research question, it was noted that organizations facing greater challenges in performance measurement often recognize the need to adapt to changes in the environment. It is of crucial importance to examine in more detail the specific challenges involved, which might include inadequate system flexibility, the complexity of measurement procedures, a lack of resources, and the organization's ability to respond to feedback. These challenges require strategies that would include increasing system flexibility and better adaptation to changes in the environment, which is a critical issue for healthcare organization management. All these insights are interconnected, as they point to the complexity of implementing performance measurement systems, especially in a sector like healthcare, where challenges and sensitivity to change are particularly pronounced.

6. Conclusion

Measurements must be a part of activities as a continuous practice for identifying external influences, monitoring the internal organizational system, and analyzing deviations. These activities initiate and bolster the implementation of enhancement efforts and raise awareness of specific issues of healthcare organizations. Healthcare organizations' managers need to bear in mind that performance measurement is both exploratory and regulatory.

The literature review in this paper provides a comprehensive perception of the development of performance measurement systems, identifying key determinants and challenges in this process. Highlighting the importance of performance indicators is a key contribution, as it theoretically points to specific indicators that managers can use for monitoring, evaluating, and improving performance. Thus contributing to a better understanding of how these systems are developed and enhanced in the specific issues of healthcare institutions. The practical contribution of this paper lies in identifying challenges within the performance measurement system, which provides a solid basis for taking measures to improve these challenges to achieve the set goals.

The results of this research provide useful insights into the current state of performance measurement systems in healthcare organizations in Serbia, however, the generalization of those results to a wider context should be carefully considered. Given the specificity of the sample (managers, executives and operational staff from private and public healthcare organizations), the findings can be applied to similar organizations, but with caution when considering other countries or healthcare systems. Further research with larger and more diverse samples may provide additional insights and allow for broader generalization.

The findings are valuable for healthcare managers, providing useful empirical data for practitioners in the area of performance measurement and policymakers in the healthcare sector who aim to foster improvements in the healthcare industry. This research has provided knowledge and a foundation for healthcare organizations in Serbia seeking acceptable solutions to current performance management issues to enhance performance and maintain competitive advantages.

There are several limitations to the research, which point to directions for future studies. One limitation relates to the respondents in the Republic of Serbia, so future research should conduct a comparative analysis of performance measurement practices in healthcare organizations with countries in the region to obtain general findings and assess their implementation in other locations or healthcare organizations. The possibility of conducting longitudinal studies based on mixed methods to further expand on the findings from this study could be explored by future researchers.

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