Int. J. Nonlinear Anal. Appl. 15 (2024) 2, 239–254
ISSN: 2008-6822 (electronic)
http://dx.doi.org/10.22075/ijnaa.2023.30099.4330

Model of operational objectives for the transparency of performance-based budgeting in the country's health system

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(Communicated by Javad Vahidi)

Abstract

This study evaluated the effect of changing the program-based budgeting system to a performance-based budgeting system in advancing organizational goals, realizing the accountability system, and economic viability. The data of this comparative and analytical study were collected through library studies and questionnaire distribution. Therefore, a general opinion was obtained by asking the opinions of 15 experts and applying the Delphi method. Friedman's test was used in SPSS software to determine the rank of each of the indicators related to each component to determine the ranking of the indicators approved by the experts. The results showed that operational objectives, as well as the indicators of the compilation of audit standards supported by the country's health system, performance audit by the country's health system, and approved standards in the health system, are critical factors for the transparency of performance-based budgeting.

Keywords: operational objectives, performance-based budgeting, accrual accounting
2020 MSC: 91B03

1 Introduction

As the people's representative to run the country, the government has unique powers such as collecting taxes, selling oil, and providing public services, including education, health, and national security. These powers require duties for the government, the most important of which is accountability to the nation, based on the Constitution of the Islamic Republic of Iran. Effective accountability requires adequate and reliable information about the government's performance to provide to the public. In Circular No. 76158 of the 2015 budget of the whole country, ministries, government institutions, and other executive bodies are required to prepare their financial statements based on the accounting standards of the country's public sector (compiled by the auditing organization) in cases of using the general government budget. Therefore, implementing the accrual accounting basis is considered a leap in financial reporting that improves accountability in the public sector [2]. Accrual accounting is based on the flow of economic resources and emphasizes performance measurement and financial and operational accountability. Financial accountability means tracking and reporting on the allocation, spending, and consumption of financial resources using accounting, auditing, and budgeting tools. Operational accountability focuses on services, outputs, and results according to the

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Received: January 2023 *Accepted:* March 2023

organization's operational goals. The responsibility of operational accountability inherently includes the concept of stewardship of public resources. Financial and capital protection and compliance of their consumption with laws and regulations (financial accountability responsibility) consists of operational accountability and effective use of resources to achieve the approved goals and l the government's obligations [32].

Performance appraisal evolved over the past 50 years, expanded beyond financial auditing and internal controls, and became a respected mechanism for continuous improvement and organizational effectiveness [31]. The authorities' awareness of the need to fulfil the responsibility of accountability regarding the protection and correct use of public financial and economic resources and the knowledge of the facilities needed to improve the level of this responsibility provides the necessary grounds for the establishment of an accounting and financial reporting system based on the responsibility of accountability [21]. While interacting and communicating with each other, accounting and auditing play a role as two targeted systems in the public accountability system [20]. Considering the role of the budget as the basis of accountability in the accountability process, a clear picture of the accountability system is revealed. The primary user groups (citizens and their representatives) evaluate the public accountability of the government by using the audited financial reports of the public sector. Determining goals and performance results can make managers accountable and give them the power to exercise more discretion in choosing new management tools [6].

The experiences of developed and developing countries, including Korea, Canada, England, Norway, South Africa, Chile, Ukraine, and Turkey, were reviewed and evaluated. Implementation of the monitoring and evaluation (M&E) system based on operational budgeting and emphasis on results by adding accountability and aspects such as efficiency, effectiveness, and economic efficiency to the previous traditional system were investigated. The results included improving the quality of public services, achieving performance goals, reducing budget deviations due to the correct and results-based allocation of public funds, significantly reducing corruption, improving the transparency of results, gaining public trust, and managerial and economic decisions. These results prove the need to identify the influential factors in developing the ideal model for monitoring and evaluation in Iran. Therefore, a systematic process called performance auditing is required. Measuring the performance of management with three factors of efficiency, effectiveness, and economic efficiency will gain meaning and meaning. The management has no restrictions in using all the resources under its control, including financial and human resources, and their selection and arrangement should be according to its wishes. These factors have made managers' audit and performance measurement face challenges, such as the influence of managerial decisions from outside the organization, the conflict between legislators and the flow of law, and the non-acceptance of risk in managerial decisions [8]. The challenge in the budgeting system and the lack of specific criteria in the financial and administrative system of executive bodies caused disruptions in establishing financial and economic discipline in the budgeting system. Instead, in budgeting, fierce competition between different institutions to increase their budget share prevails. Therefore, reforming the country's budgeting system and, subsequently, the financial monitoring system of the public sector based on operations and preparing a report on the subtraction of the entire country's budget on this basis will lead to increasing the accountability of executive bodies, transparency of performance, improving the quality, and effectiveness of annual budgets [25].

Accrual accounting is required to implement performance-based budgeting. Therefore, it is necessary to present a model in the field of health systems that provides performance-based budgeting in the best way. Performance-based budgeting based on accrual accounting became mandatory in the country's health system. As a rule, traditional budgeting was abandoned, and performance-based budgeting replaced it. So far, no research has been done in Iran regarding performance-based budgeting in the country's health system.

This study aims to evaluate the effect of accrual accounting on Iran's health system based on the transparency of performance-based budgeting and its components.

Considering the importance of budgeting in macro decision-making in the country, the budget officials believe that budgeting in Iran faces many issues and problems despite nearly a century of executive history. The current economic and social conditions cause these problems, but some others, which are more critical, are rooted in the administrative and financial structure of the country [17]. The need to improve planning systems, public sector resource management, specify goals, emphasize results to reduce costs, and increase the quality of services became more critical with the rapid increase in government spending and its link with the general state of the country's economy. Traditional budgeting methods do not meet the needs of decision-makers and managers at different levels to manage operations and do not lead to an increase in productivity. For this reason, in the last decade, the issue of revising the budget system and turning it into one of the management tools for effective decision-making was raised [3].

Most researchers introduce performance-based budgeting as a solution to the problem, which is formed by adding efficiency and effectiveness to the traditional budgeting dimensions. This system distinguishes between efficiency and effectiveness. The operations are classified, so the goals are more clearly stated, and the budget evaluation is

more straightforward. The costing method considers the relationship between data and output [22]. Emphasis on results allows users to gain a broader view and have extensive information about the performance results and the cost of implementing activities. Therefore, policymakers pay attention to the economy, efficiency, and effectiveness of government resources. Facing these conditions has led to the need to improve existing budgeting methods and procedures to increase coordination in this system and has proposed a new dimension to review and evaluate the management of government activities [15]. The goal of performance-based budgeting is to help the organization decide on the prioritization of programs according to the challenges facing the organization, to make wise decisions on the allocation of resources, to establish a relationship between the budget and the performance results of the programs [18].

The Ministry of Health, Treatment, and Medical Education is one of the four institutions required to implement performance-based budgeting in the country. From the view of university management, it is more necessary than ever t,o change the budgeting system of universities and to revise and fundamentally transform the existing budgeting system [1]. Research on performance-based budgeting is accepted in many countries, but only some have implemented this method. The evidence obtained from these studies shows that most governments can create useful information. However, very few of them use this information in decisions related to resource allocation and formulation and development of result-oriented motivational plans [24]. The research results can be helpful as a suitable road map for experts in this field and affiliated institutions. In addition, the results are useful for researchers who intend to take a step in this field.

2 Theoretical foundations

This study aimed to introduce the factors in a model related to the transparency of performance-based budgeting in the country's health system, which was conducted in three stages, including comparative study, research question, and statistical analysis. First, the theoretical foundations and the background of research related to performance audits were studied to identify the dimensions, components, and indicators. Then, the Delphi approach was used to obtain the consensus of the general opinion of the country's public sector auditors.

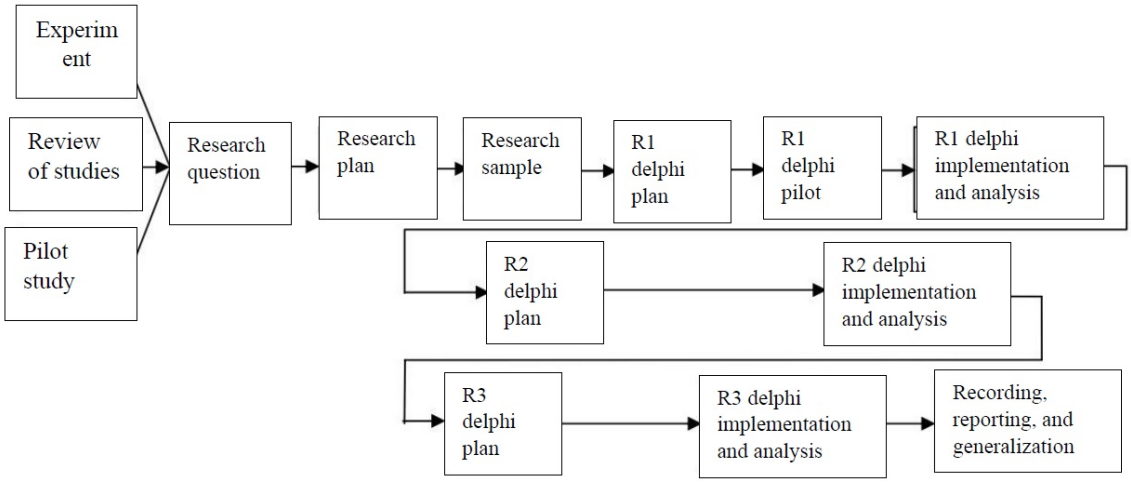

Figure 1: The main steps of conducting a Delphi study

Accountability: According to conceptual statement number one of the American Governmental Accounting Standards Board, a person should explain and provide logical reasons for his actions and decisions [30]. Therefore, accountability is a social process in which citizens, policymakers, and public officials are motivated to respond effectively to the services they provide [11, 23]. Accountability can be achieved with effective external and internal reporting, which should show the dimensions of compliance and organizational management performance against the goals. The compliance dimension shows compliance with legal requirements, approved standards, and society's expectations, and the performance dimension expresses organizational results' overall performance and presentation [35].

Operational accountability: It is carried out according to the set operational goals and emphasizes the study and optimal use of resources [32, 40].

The responsibility of operational accountability requires the executive authorities of government organizations to inform citizens and their legal representatives about the achievement of approved operational goals and the effectiveness

of operations through reports. In this regard, operational accountability emphasizes the efficiency and effectiveness of resources for approved purposes rather than merely emphasizing inputs. The components of efficiency, energy, and economic efficiency are essential and influential in government institutions because they cause optimal consumption of resources [13].

Transparency of information and reports means providing accounting information with obvious content [19]. Accountability and transparency are two sides of the same coin, and a lack of accountability and transparency also makes it difficult. Non-transparency of financial reports causes a loss of information symmetry between people and officials and provides the field for financial corruption. For this reason, nowadays, two categories of transparency and accountability are given much attention [29].

Accrual basis of accounting: The implementation of the accrual basis of accounting and the necessity of performance audit have been considered in the research on financial and operational accountability [10]. The accrual basis of accounting by recording all financial events makes incomes, expenses, property, and assets clear. This basis allows managers to make more informed decisions, reduce costs, improve resource allocation, and increase productivity by measuring performance and accurate management information [10, 26]. Therefore, the accrual basis of accounting provides the context for accurate forecasting of revenues and costs, establishing operational budgeting, and the necessary platform for managing costs and calculating the cost of projects. Operational accountability is achieved through performance auditing according to operational goals and focusing on services, outputs, and results [26, 36].

3 Research literature

Sotoudeh et al. [38] evaluated the ability of the National Audit Office to carry out operational accountability. Based on this study, the indicators and components of operational accountability of the National Accounts Court, including reporting on the extent of achieving operational goals, economic effectiveness of financial resources, operational reporting about performance-based budgeting, reporting on financial and non-financial resources, monitoring the outputs and results of activities and performance evaluation, are not evaluated favorably. The National Accounts Court needs to have the proper ability to carry out the responsibility of operational accountability.

Azar and Habashi [7] presented an effective model for auditing the Accounts Court of the Islamic Republic of Iran's public sector. This study aimed to examine the public sector audit of the higher audit institutions of twelve developed and developing countries and to provide an effective model for the Accounting Court of the Islamic Republic of Iran. According to experts, there was a significant difference between public sector budgeting, auditing standards, the structure and independence of the Court of Accounts (higher audit institutions), performance evaluation, reporting of the Court of Accounts and enforcement of findings and dealing with violations in developed and developing countries like Iran.

Bostani et al. [9] concluded that performance-based budgeting adds saving and effectiveness factors to budgeting, distinguishing between efficiency and effectiveness. Efficiency and practical use of resources are desired, while effectiveness is related to performance. Operations in performance-based budgeting are classified in such a way that goals are expressed more clearly. It is easy to evaluate the budget, and the relationship between data and output is considered in its costing method. In addition, the most crucial goal of the performance-based budgeting system is to reform the public sector management system and increase the effectiveness of this sector's expenditures.

Pourali and Kakuvan [33] evaluated the feasibility of implementing operational budgeting at Babol university of medical sciences and health services. The data were collected from 30 presidents, vice presidents, managers, and the Babol University of Medical Sciences and Healthcare Services financial and budget experts in a questionnaire. The results showed that there is the ability (performance evaluation, human and technical), authority (legal, procedural, and organizational), and acceptance (political, managerial, and motivational) necessary to implement operational budgeting in that university.

Tran et al. [39] investigated the mediating role of public sector accountability in determining the relationship between the quality of financial reporting and the performance of Vietnamese public organizations by drawing on new general management and agency theory. The research model and hypotheses were tested with a sample of 177 accountants and managers working in the public sector of Vietnam. The analysis showed that accountability plays a mediating role in the relationship between the quality of financial reporting and the performance of government organizations. This finding is significant for government organizations that seek to improve the quality of financial reporting and organizational performance by designing a better accountability system.

Mauro et al. [27] showed that integrating communication, values, and goals among actors and managers of different government departments creates limitations for applying performance-based budgeting in practice.

Park [31] conducted a study in the US on the importance of the role of citizens in performance-based budgeting. The results showed that governments with more public accountability and actively respond to citizens' demands tend to use this budgeting style. In addition, their performance in implementing performance-based budgeting has been more successful.

Deshpande [12] examined a Budget Supervision System in Myanmar, which had the transfer of more concentration. The union government took fundamental measures to strengthen the public financial management system and improve financial transparency by establishing institutions. The Parliament's General Accounts Committee, granting independence to the central bank, and creating a Treasury Department were among the initiatives that effectively set a monitoring and evaluation system.

Ancarani et al. [5] evaluated the effect of management and organizational decision-making on hospital divisions in Europe and presented a model in the health sector about decision-making and technical efficiency. Based on the results, managers' decisions to use resources had a more significant impact on the efficiency of the health sectors than the extracurricular factors.

4 Research questions

The research questions were raised in five questions based on the theoretical foundations and background of performance-based budgeting research in the country's health system and the relevant laws and regulations.

1. What are the dimensions of performance-based budgeting transparency in the country's health system?
2. What are the components of performance-based budgeting transparency in the country's health system?
3. What are the indicators of performance-based budgeting transparency in the country's health system?
4. What will be the ranking of performance-based budgetary transparency indicators in the country's health system?
5. What is the appropriate pattern for transparency of performance-based budgeting in the country's health system?

5 Research method

This cross-sectional, descriptive, and comparative study was conducted using a time series and data panel at one point in time. In addition, this applied-developmental study sought to provide a model for transparency of performance-based budgeting in the country's health system.

The required information was collected through library studies and questionnaire distribution. First, the theoretical foundations and background of performance-based budgeting research were extracted into the country's health system. Then, the relevant regulations and regulations of the study and dimensions, components, and indicators of performance-based budgeting patterns were determined. The Research Questionnaire was designed with 35 general questions and specific questions for senior managers (10 questions), financial heads (12 questions), and for financial experts (8 questions) using a 5-point Likert scale (completely high to low). The population was extracted from the list of financial staff, including members of the three groups of people aware of the budget stages (preparation, approval, implementation, and supervision) in the country's health system, including senior managers and deputies, managers and accounting chiefs, and heads of accounting Financial and budget experts (regulating documents, salaries, audits, contracts, business, and budgets). The targeted sampling was used based on the research subject and interviews. This method includes an example selected based on the experience or knowledge of the researcher from the study community. Therefore, public opinion was obtained by surveying 15 experts and using the Delphi method. Subsequently, the Friedman test was used in SPSS software to determine the rating of the indicators approved by the experts to assess the level of each indicator for each component. Based on the results of Friedman's test, each component was rated based on its importance and performance-based budgetary transparency pattern in the country's health system.

The study variables included operational goals, efficiency and effectiveness of financial resources, operational reporting, and operational accountability, which were analyzed using questions from different parts of the questionnaire. The amount of Cronbach's alpha is calculated using the following Equation (5.1):

$$\alpha = \frac{k}{k-1}\left(1 - \frac{\sum_{i=1}^{k} S_i^2}{S_t^2}\right) \tag{5.1}$$

where, α is the amount of internal reliability or homogeneity, K is the number of questions, S_i^2 is the variance of each question, an S_t^2 is the variance of all questions. The present study used Cronbach's alpha reliability coefficients to approve the questionnaire.

Table 1: The reliability of the questionnaire by dimension

Dimension	Cronbach's alpha
Operating goals	0.866
Efficiency and effectiveness of financial resources	0.806
Operational reporting	0.815
Operational accountability	0.942

Table 1 shows that the reliability coefficient of Cronbach's alpha for the research questionnaire and all its components was more than 0.7. Therefore, the research questionnaire and its components are reliable.

Kolmogorov-Smirnov Test

Equation (5.2) is used to calculate the amount of experimental distribution function at point 1 for different values of the random variable XI:

$$\hat{F}_n(\varkappa) = \frac{1}{n}\sum_{i=1}^{n} I[-\infty, \varkappa](X_i) \tag{5.2}$$

where, $I[-\infty, \varkappa](X_i)$ is the marker function that will be zero for $< \varkappa X_i$ is one and otherwise is zero. X_i is for an N-sample that is independent of each other.

Kolmogorov-Smirnov statistics

According to the experimental distribution function definition, the Kolmogorov-Smirnov statistics are defined as follows.

$$D_n = \sup_x |\widehat{F_n}(\varkappa) - F(\varkappa)| \tag{5.3}$$

$\sup_x$ is used to find the smallest high-end bound for the distance between the two empirical distributions and the actual distribution to all values. When the observations are of the distribution of $F(\varkappa)$, the value of the D_n will be zero by increasing the value of n.

The null and research hypotheses in the Kolmogorov-Smirnov test are written as follows:

H0: Experimental distribution is the same as the original distribution.

H1: Experimental distribution is not the same as the original distribution.

To determine the critical zone of the higher upper quantile of the upper distribution of Kolmogorov ($K\alpha$), if the distribution of Kolmogorov $\sqrt{N}D_n$ is larger than $K\alpha$, the hypothesis of zero (i.e., the experimental distribution of the actual distribution) will be rejected.

$$\sqrt{N}D_n > K\alpha, \text{ Reject H0}, Pr(K \leq K\alpha) = 1 - \alpha \tag{5.4}$$

Statistical assumption of a population (T-test, one sample)

Whenever the sample is selected from a normal society with an unknown standard deviation, the sampling distribution of x based on the sample size is determined as follows:

$$t = \frac{\overline{X} - \mu}{s/\sqrt{n}} \tag{5.5}$$

Some random distribution and the degree of freedom of $r = n - 1$.

The terms for using the T-test are as follows:

- Small sample ($n < 30$).
- The variance of the unknown community.

The distribution of the main population is because when the sample number is more than 30, the distribution of T in SPSS software will be automatically converted to Z distribution.

Friedman's statistics

This statistic is shown with χ_r^2 using the following relationship in two ways:

$$\chi_r^2 = \frac{SS_{br}}{\frac{k(k+1)}{12}} \tag{5.6}$$

where SS_{br} is the sum of the rank between the distribution and k is the number of ranked categories or distributions.

$$\chi_r^2 = \frac{12}{Nk(k+1)} \sum (T_g)^2 - 2N(k+1) \tag{5.7}$$

where N is the number of subjects, K is the number of categories or distributions that are ranked in the case, and T_g is the Group G rankings.

$$SS_{br} = \frac{\sum (T_g)^2}{N} - \frac{(T_{all})^2}{N_a} \tag{5.8}$$

where N_a is the total rankings of all groups, and T_{all} is the total rankings allocated to subjects.

The statistics of this test are compared with the necessary amount of the chi-2 distribution table with k-1 degree of freedom and at the desired confidence level, usually 95%. If χ_r^2 is larger than the critical value of the table, the zero hypotheses will not be confirmed.

6 Results

Descriptive statistics include gender, age, service history, organizational post, education rate, and participation in related training courses, as described in Table 2. According to descriptive statistics, 86.7% were male and other female testers and about 73.3% were 30 to 40 years. In addition, 60% of the testers had a history of service between 10 and 20 years, 40% were senior executives, 40% were management, and the rest were faculty and expert. Among the subjects, 53.3% had a doctoral degree, and 46.7% had a master's degree, of which 93.3% attended relevant training courses.

Table 2: Descriptive statistics associated with demographic variables

Variable	**Index**	**Frequency**	**Frequency percentage**
Gender	Male	13	7.86
	Female	2	3.13
Age	20-30 years	1	7.6
	30-40 years	11	3.73
	Above 40 years	3	20
Years of experience	Less than five years	1	7.6
	5-10 years	3	20
	10-20 years	9	60
	Above 20 years	2	3.13
Organizational position	Senior manager	6	40
	Management	6	40
	Expert	1	7.6
	Faculty member	2	3.13
Education	PhD	8	3.53
	Master's	7	7.46
Educational courses	Yes	14	3.93
	No	1	7.6
–	Total	15	100

6.1 Investigating the normal distribution of variables (Kolmogorov-Smirnov test)

The Kolmogorov-Semirnov test was used to investigate the normal data distribution. According to Table 3, the significant level of the dimensions of operational goals, efficiency, the effectiveness of financial resources, and operational reporting is higher than 5%. Therefore, the assumption that the data distribution is normal was accepted for the abovementioned dimensions. However, the test result had a significantly less than 5% level for the operational dimension. Therefore, as a result, the data distribution assumption was not accepted for this dimension.

Table 3: Normal Dimensional Distribution Investigation (Kolmogorov-Smirnov Test)

Dimension	Mean	Statistics	Significant level	Result
Operating goals	3	0.833	0.492	Normal distribution
Efficiency and effectiveness of financial resources	2.62	0.975	0.297	Normal distribution
Operational reporting	2.37	0.930	0.352	Normal distribution
Operational accountability	2.26	1.556	0.016	Normal distribution

6.2 Inferential statistics

Unprecedented methods, including t-test tests, were used to test the research questions. The research questions were raised in five questions based on the theoretical foundations and background of performance-based budgeting research in the country's health system and the relevant laws and regulations.

Question One: What are the dimensions of performance-based budgeting transparency in the country's health system?

According to Table 4, the test results for the first question for the efficiency and effectiveness of financial resources were significantly above 5%. Therefore, the answer to the first question is negative after the viewers' view. However, the test result was less than 5% for the dimensions of operational goals, operational reporting, and operational accountability. Therefore, the answer to the first question is positive, given these dimensions.

Table 4: The first question inferential test

Dimension	Mean	Standard deviation	T-value	Degree of freedom	Significant level	Result
Operating goals	3	0.278	6.943	14	0	Confirmed
Efficiency and effectiveness of financial resources	2.62	0.279	1.69	14	0.113	Rejected
Operational reporting	2.37	0.130	−3.732	14	0.002	Confirmed
Operational accountability	2.26	0.371	−2.432	14	0.029	Confirmed

Table 4 presents the test results using the t-test method. As shown in Table 4, the average of operating reporting and operating accountability is less than the desired limit (2.5). In other words, most people have given these dimensions less than 2.5. Given that the optimal average score of 2.5 and above is the criterion for assessing and accepting research questions is not taken for the first question of operational reporting and operational accountability. Further, the efficiency and effectiveness of financial resources due to the significant level of 5% are not approved. In general, the dimension of operational goals in response to the first question is approved. From the respondents' perspective, transparency is needed to implement performance-based budgeting in the country's health system.

The second question: What are the components of performance-based budgeting transparency in the country's health system?

According to Table 5, the second question test results for efficiency components and efficiency of funding, performance-based budgeting, reporting of financial and non-financial resources, and monitoring of outputs are significantly higher than 5%. Therefore, the answer to the second question is negative with these components, but for the components of operational goals and operational accountability, the test result is less than 5%. Thus, the answer to the second question is positive with these components.

Table 5 presents the results of the second question using the t-test method. The average components of performance-based budgeting, financial and non-financial resource reporting, output monitoring, and operational accountability are less than optimal (2.5). In other words, most people gave these components a score of less than 2.5; the average score of 2.5 and above is the criterion for evaluating and accepting the research questions. The components of performance-based budgeting, financial and non-financial resource reporting, output monitoring, and operational accountability are rejected for the second research question. In addition, the efficiency and effectiveness component of financial resources is not confirmed due to the significance level of more than 5%.

The operational objectives component is generally approved in response to the second question. According to the respondents, there is necessary transparency in implementing performance-based budgeting in the country's health system.

Table 5: Inferential test of the second question (Since the average desired score of 2.5 and above is the criterion for accepting the research questions, the components with a standard deviation > 5% were excluded from the test result.)

Component	Mean	Standard deviation	T-value	Degree of freedom	Significant level	Result
Operating goals	3	0.278	6.943	14	0	Confirmed
Efficiency and effectiveness of financial resources	2.62	0.279	1.69	14	0.113	Rejected
Performance-based budgeting, financial and non-financial resource reporting, output monitoring	2.48	0.175	−0.250	14	0.806	Rejected
Operational accountability	2.40	0.507	−0.764	14	0.458	Rejected
operational goals	2.23	0.593	−1.740	14	0.104	Rejected
Efficiency and effectiveness of financial resources	2.26	0.371	−2.432	14	0.029	Confirmed

Third question: What are the transparency indicators of performance-based budgeting in the country's health system?

In this research, respondents' opinions about the indicators related to the third question of the research were collected based on a 5-point Likert scale. The calculated mean and standard deviation for each question are presented in Table 6. The highest standard deviation was related to the indices of "Monitoring the effectiveness and economic efficiency of the activities of executive bodies by the country's health system" (1.014) and "Evaluation of the performance of executive bodies by the country's health system" (0.975). Respondents had different opinions regarding these indicators. On the other hand, the lowest standard deviation (0.258) belonged to the indicators of "performance audit by the country's health system" and "implementation of information systems and operational reporting infrastructure by the country's health system." The respondents had the same opinions regarding these indicators. The highest averages (3.33, 2.93, and 2.73, respectively) were related to the indicators of "compilation of audit standards approved by the country's health system," "performance audit by the country's health system," and "implementation of approved standards in assigned matters." Most respondents emphasized these issues. On the other hand, the lowest average of 2.06 belonged to the index "Implementation of information systems and operational reporting infrastructures by the country's health system." According to the respondents, these indicators are less critical.

Table 6: Inferential test of the third question (Since the average desired score of 2.5 and above is the criterion for evaluating and accepting research questions, the test results of components with a standard deviation of more than 5% were excluded.)

Component	Index	Mean	Standard deviation
Operational goals	Performance audit by the country's health system	2.93	0.258
	Development of audit standards approved by the country's health system	3.33	0.487
	Implementation of approved standards in matters assigned to the country's health system	2.73	0.457
Efficiency and effectiveness of financial resources	Reporting on the efficiency of financial resources at the disposal of executive bodies by the country's health system	2.66	0.487
	Reporting on the effectiveness of financial resources at the disposal of executive bodies by the country's health system	2.60	0.507
	Reporting on the economic efficiency of financial resources at the disposal of executive bodies by the country's health system	2.60	0.507
Performance-based budgeting	Implementation of the necessary mechanisms by the country's health system for the operational reporting of executive bodies	2.66	0.487
	Compilation of approved operational reporting standards of executive bodies	2.73	0.457

	Implementation of information systems and operational reporting infrastructure by the country's health system	2.06	0.258
Financial and non-financial resources reporting	Reporting on financial and non-financial resources at the disposal of executive bodies by the country's health system	2.40	0.507
	Reporting on financial and non-financial expenses at the disposal of executive bodies by the country's health system	2.40	0.507
Monitor outputs	Supervision of the efficiency of the activities of executive bodies by the country's health system	2.26	0.457
	Supervision of the effectiveness and economic efficiency of the activities of the executive bodies by the country's health system	2.20	1.014
Operational accountability	Monitoring the performance of executive bodies by the country's health system	2.20	0.414
	Evaluation of the performance of executive bodies by the country's health system	2.33	0.975

Question 4: How will performance-based budgeting transparency indicators be ranked in the country's health system?

Friedman's test was used to rank the dimensions, components, and indicators of performance-based budgeting transparency in the country's health system (Tables 7 to 9). Considering the statistical significance of the two assumptions, the equality of the average ranks of the first to last factors is not accepted at the 5% error level. Therefore, from the subjects' point of view, there is a significant difference between the dimensions, components, and indicators of performance-based budgeting transparency in the country's health system.

Table 7 shows the results of Friedman's ranking test to rank the transparency dimensions of performance-based budgeting. According to the respondents, the dimension of operational goals is in the first place, with an average rating of 5.70. The dimension of efficiency and effectiveness of financial resources is in second place, with an average rating of 4.30. Operational reporting is in third place with an average rank of 2.33, and operational accountability is in fourth place with an average rank of 2.17.

Table 7: Friedman rank test for ranking the transparency dimensions of performance-based budgeting

Dimension	**Rank mean**	**Rank**
Operational goals	5.70	First
Efficiency and effectiveness of financial resources	4.30	Second
Operational reporting	2.33	Third
Operational accountability	2.17	Fourth
Test statistics	Chi-square	The significance level
	85.325	0.000

Table 8: Friedman rank test for ranking the transparency components of performance-based budgeting (Since the average desired score of 2.5 and above is the criterion for evaluating and accepting the research questions, and according to the test results, the components with a standard deviation of more than 5% were removed.)

Component	**Rank mean**	**Rank**
Operational goals	8.60	First
Efficiency and effectiveness of financial resources	5.87	Second
Performance-based budgeting, financial and non-financial resource reporting, output monitoring	5.33	Third
Operational accountability	5.33	Third
operational goals	5.30	Fourth
Efficiency and effectiveness of financial resources	4.13	Fifth
Operational goals	Chi-square	The significance level
	192.008	0.000

Table 8 presents the results of Friedman's rank test for ranking the transparency components of performance-based budgeting. According to the respondents, the components of operational goals and efficiency and effectiveness of financial resources are in the first and second ranks, respectively, with average ranks of 8.60 and 5.87. On the other hand, the lowest ranks, with an average of 5.30 and 4.13, belonged to the components of output monitoring and operational accountability, respectively.

Table 9 indicates Friedman's rank test for ranking performance-based budgeting transparency indicators. Based on the respondents, "Development of audit standards approved by the country's health system," "Performance audit by the country's health system," and "Implementation of approved standards in matters assigned to the country's health system" are in the first, second, and third ranks with the average ranks of 19.53, 14.00, and 11.97, respectively. On the other hand, the lowest ranks, with an average of 7.33, 6.23, and 5.03, belonged to "monitoring the efficiency of the executive bodies' activities by the country's health system," "monitoring the effectiveness and economic efficiency of the activities of executive bodies by the country's health system," "Implementation of information systems and operational reporting infrastructures by the country's health system."

Table 9: Friedman rank test for ranking performance-based budgeting transparency indicators

Component	**Index**	**Rank Mean**	**Rank**
Operational goals	Performance audit by the country's health system	14	Second
	Development of audit standards approved by the country's health system	19.53	First
	Implementation of approved standards in matters assigned to the country's health system	11.97	Third
Efficiency and effectiveness of financial resources	Reporting on the efficiency of financial resources at the disposal of executive bodies by the country's health system	11.87	Fourth
	Reporting on the effectiveness of financial resources at the disposal of executive bodies by the country's health system	10.33	Seventh
	Reporting on the economic efficiency of financial resources at the disposal of executive bodies by the country's health system	11	Fifth
Performance-based budgeting	Implementation of the necessary mechanisms by the country's health system for the operational reporting of executive bodies	11.87	Fourth
	Compilation of approved operational reporting standards of executive bodies	11.97	Third
	Implementation of information systems and operational reporting infrastructure by the country's health system	5.03	Twelfth
Financial and non-financial resources reporting	Reporting on financial and non-financial resources at the disposal of executive bodies by the country's health system	8.97	Ninth
	Reporting on financial and non-financial expenses at the disposal of executive bodies by the country's health system	8.97	Ninth
Monitor outputs	Supervision of the efficiency of the activities of executive bodies by the country's health system	7.33	Tenth
	Supervision of the effectiveness and economic efficiency of the activities of the executive bodies by the country's health system	9.23	Eighth
Operational accountability	Monitoring the performance of executive bodies by the country's health system	6.23	Eleventh
	Evaluation of the performance of executive bodies by the country's health system	10.50	Sixth
Test statistics		Chi-square	The significance level
		299.735	0.000

Question 5: What is the appropriate model for the transparency of performance-based budgeting in the country's health system?

In general, the dimension of operational goals is confirmed in response to the first question. According to this aspect, from the respondents' point of view, transparency in implementing performance-based budgeting in the country's health system is necessary.

According to the results of the t-test, the operational objectives component is confirmed in answer to the second question. From the respondents' point of view, there is necessary transparency for implementing performance-based budgeting in the country's health system.

The respondents' opinion on the indicators of the third question of the study showed that the lowest standard deviation of 0.28 was based on the "performance audit by the country's health system" indicators. In other words, the respondents have the same comments on this index. In addition, the highest average of 3.33, 2.93, and 2.73, respectively, belonged to the indicators of "Audit Standards Development by the State Health System," "Performance Audit by the State Health System," and "Implementation of Approved Standards for Affairs".

Table 7 represents the results of Friedman's rank test of the dimensions of performance-based budgetary budgeting. The following respondents' operational goals are ranked first, averaging 5.70.

According to the test results, Friedman is the component of operational goals with an average of 8.60.

Friedman's ranking test showed that Indicators of "Audit Standards Development by the State Health System," "Performance Audit by the State Health System," and "Implementation of Standards approved in the Country Health System" (19.53, 14, and 11.97) ranked the first to third rankings.

7 Conclusion

This study developed a model for transparency of performance-based budgeting in the country's health system. The research objective was to evaluate the effect of changing the performance-based budgeting system in advancing organizational goals and fulfilling the response system and affordability.

The research questions were raised in five questions based on the theoretical foundations and background of performance-based budgeting research in the country's health system and the relevant laws and regulations.

The first question: What are the dimensions of performance-based budgeting transparency in the country's health system?

Table 4 shows that the operational goals are approved in response to the first question. The respondents' point of view is the necessary transparency to implement performance-based budgeting in the country's health system.

Bostani et al. [9] concluded that budgeting is based on the performance of the savings factors and effectiveness of budgeting, which distinguishes between efficiency and effectiveness. Efficiency helps use the resources, while effectiveness is related to performance. Operations are such that the goals are more transparent in budgeting based on performance classification. The budget evaluation is easier to evaluate, and the connection between the cost and the output is considered. The essential goal of the budgetary system is to reform the public sector management system and increase the effectiveness of this sector.

Tran et al. [39] examined the mediating role of public accountability in determining the relationship between financial reporting and the performance of Vietnam state-owned organizations by drawing new general management and representation theory. The research model and assumptions were tested with 177 accountants and managers in the Vietnam Public sector. The analysis showed that accountability has an intermediary role in the relationship between the quality of the financial report and the performance of government agencies. This finding is considerable for government agencies seeking to improve financial reports' quality and organizational performance through better accountability system design.

Mauro et al. [27] showed that the lack of integrity between communication, values, and goals between actors and managers of different departments of government agencies would create restrictions on the use of performance-based budgeting.

Park [31] indicated that governments with more public accountability and actively respond to citizens' demands are more likely to use this budgeting style. In addition, the performance of these governments has been more successful in implementing performance-based budgeting.

The second question: What are the components of performance-based budgeting transparency in

the country's health system?

Table 5 presents that the component of operational goals is approved in response to the second question. Therefore, there is transparency needed to implement performance-based budgeting in the country's health system by the respondents.

Sotoudeh et al. [38] found that from the perspective of the subjects, the indicators and components of the operational accountability carried out by the State Accounting Court include: Reporting on the extent of operational goals, reporting on efficiency, effectiveness, and economic costs, operational reporting due to performance-based budgeting, reporting on financial and non-financial resources, monitoring outputs. The activities and performance evaluation results are not evaluated in a failed manner, and the country's accounting Court has no desirable ability to fulfill operational accountability.

Third Question: What are the country's health system performance-based budgetary transparency indicators?

Based on Table 6, the highest criteria diverts are related to the indicators of "Effectiveness and Economic Supervision of the Country Health System" (1.014) and "Evaluation of the Performance of Implementation by the State Health System" (0.975). The respondents had different opinions on these indicators. In contrast, the lowest standard deviation (0.208) belonged to the indicators of "performing performance auditing by the country's health system," and "implementing information systems and operational reporting infrastructure by the country's health system." In other words, the respondents had the same views on these indicators. The highest average (3.33, 2.93, and 2.73) was obtained in the indicators of "Compiling Audit Standards Approved by the State Health System," "Auditing Performance by the State Health System," and "Implementing Standards approved in the country's health system." The emphasis of respondents was on these issues. On the other hand, the lowest average (2.06) belonged to the "Implementation of Information Systems and Operational Reporting Infrastructure by the State Health System." These indicators were less important to the respondents.

Sharbatdar and Asili [37] performance-based budgeting is one of the ways to enhance accountability and responsibility. Identified restrictions based on performance-based budgeting are not managers' familiarity with the benefits of its successful implementation and insufficient training of managers and experts. Incentives should also be used to change the look and practice of executives' and employees' behavior.

Erkutlu et al. [14] evaluated factors affecting performance budgeting due to critical factor analysis (CFA) using an independent t-test and one-sided variance analysis in Turkish public organizations. The results of data analysis have shown the accuracy of their measuring factors and indicators. Model fit indicators also showed good values.

Question Fourth: What will be the ranking of performance-based budgetary transparency indicators in the country's health system?

Friedman's ranking test results in Table 7 show that the operational goals were ranked first with an average of 5.70. Based on Friedman's ranking test results, Table 8 is the first component of operational goals, with an average of 8.60.

Table 9 indicates that the indicators of "Audit Standards Development by the State Health System," "performance audit by the country's health system" and "implementing standards approved in the affairs of the country's health system" (19.53, 14, and 11.97) are in the first, second and third ranks. The lowest rank (7.33, 6.23, and 5.03) respectively belonged to "Monitoring the efficiency of executive activities by the country's health system," "Monitoring the Effectiveness and Economic Effect of Implementation Activities by the State Health System," "Implementing Information Systems and Operational Reporting Infrastructure by the State Health System."

Pourzamani and Naderi [34] examined barriers to performance-based budgeting in Iranian Free Trade-Industrial Zones. The obstacles to performance-based budgeting were the inability to evaluate performance, the failure of human resources, the lack of legal and procedural authority, and the lack of acceptance incentives. However, technical ability, organizational authority, political acceptance, and management acceptance were not identified as obstacles. Further, free trade-industrial organizations need to be able to enforce performance-based budgeting.

Foroughi et al. [16] assessed the feasibility of spending on budgeting based on the performance of government agencies in four state agencies in Isfahan province. The requirements for implementing a cost-based method based on performance-based budgeting, such as employee capability, technical capability, legitimacy (legal legitimacy, procedural and organizational), and acceptance (political, managerial, and incentives), are not provided. The ability to evaluate performance is the only offered condition. Using cost-based methods in performance-based change makes it challenging to perform a program-based budget.

Moradi et al. [28] found that according to the subjects in the Shiraz municipality, there is no ability to implement operational budgeting (in all three dimensions, including the ability to evaluate performance, human ability, and technical ability). However, there is the necessary authority regarding all three dimensions, namely legal, procedural, and organizational management. According to the subjects, there are good conditions for two acceptance dimensions (including political acceptance and managerial acceptance). However, there is no proper motivation to execute in the other dimension of approval (motivational admission). The results show that implementing operational budgeting makes Shiraz's economic cost.

Question 5: What is the appropriate pattern for performance-based budgeting transparency in the country's health system?

The results showed that operational goals, as well as indicators of "Developing Audit Standards Approved by the State Health System," "Auditing Performance by the State Health System," and "Implementing Standards Approved Standards in the Country Health System," are the most critical factors for transparency of performance-based budgeting in the country's health system.

Pourali and Kakvan [33] investigated operational budgeting at Babol university of medical sciences and health services. A total of 30 questionnaires were collected from the Chairman, all deputies, managers, and financial experts, and the budget of Babol University of Medical Sciences and Health Services. Based on this study, the university has the ability (evaluation of performance, human resources, and technical), authority (legal, procedural, and organizational), and admission (political, managerial, and motivational) for the implementation of operational budgeting.

Amraee and Azar [4] identified key factors and provided an effective model for monitoring and evaluating public sector financial performance in performance-based budgeting using the fuzzy Delphi method. The findings identified 213 concepts that affect the evaluation in six principal codes, including the significant category of causal factors, interventional factors, contextual factors, strategies, and consequences. Finally, formulating a practical and comprehensive model for monitoring and evaluating the financial performance of the public sector in performance-based budgeting. The proposed model identified the following ten main codified "Legal and Regulatory, Structure and Organizational, Financial and Budget, Structural, Supervision and Evaluation, Content and Management Supervision, Motivational and Psychological, Technology and Information, Economical, Political and International, Cultural and Social.

Zamfirescu and Zamfirescu [41] conducted a study describing a spreadsheet solution to implement operational budgeting in a government. This solution was based on planning optimization to achieve the goal of the organization and a model for accurate data.

Ancarani et al. [5] studied the effect of management and organizational decision-making on hospital interest in Europe. This study proposed a model in the health sector about technical decision-making and efficiency. The results showed that managers' decisions to use resources had a more significant impact on the efficiency of the health sectors than the extracurricular factors.

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