




Project management of the implementation of a cost accounting standard in Polish hospitals

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Abstract

Motivation: The main source of the health system's problems is primarily the limited financial resources available within the system, but its efficiency is also affected by the not fully effective management of these resources. A solution to support management processes in terms of financial management is the introduced Regulation of the Minister of Health of 26 October 2020 on recommendations on the standard of cost accounting at healthcare providers. Proper implementation of this recommendation is a challenge for healthcare entities in Poland.

Aim: The aim of the article is to identify key success factors related to the management of the project to implement a cost accounting standard in hospitals in Poland. A properly implemented standard is to enable support of management processes and proper financial management in the health care system at the macro level, as well as at the level of the medical entity. The first period of functioning of these regulations is an opportunity to carry out a summary in this respect. The main determinants in this area include the lev-

el of staff education, the quality of the IT system, the use of expert knowledge, training support, and the relationship between medical staff and administrative staff.

Results: The research was conducted by using a survey questionnaire. On the basis of the questionnaire survey in 52 hospitals in Poland, statistical analysis was performed using basic descriptive statistics and regression analysis, which enabled the identification of key success factors for the management of the project to implement the cost accounting standard. On the basis of the analyses carried out, recommendations were made on the principles of implementing the cost accounting standard in hospitals and the directions for its effective use in management processes in the future.

Keywords: hospital; cost accounting; project management

JEL: I11; I19; K23

1. Introduction

The success of modern healthcare entities depends on how effectively decisions, in particular financial decisions, are made. A tool that provides managers with information on effective financial management is cost accounting. The efficiency of the healthcare system is often analysed in macro-microeconomic terms (Ćwiąkała-Małys et al., 2020; Głód & Głód, 2010; Raczyńska, 2020), but it should be noted that it is the adequate preparation of source data using IT systems that underlies its efficient operations (Amusawi et al., 2019; Jovanović et al., 2019). Within the Polish healthcare system, actions were taken related to the adoption of a new standard of cost accounting in healthcare entities. Legal regulations are now the foundation for initiatives in this area, so it is worthwhile to consider the practical process of their implementation. Therefore, this article aims to address the question: what are the key success factors in managing the implementation of a new cost accounting standard in Polish healthcare entities?

2. Literature review

In literature, the definitions of cost accounting vary, but the most significant differences relate to its scope. The change in the approach to the scope of cost accounting stems from the way this concept is evolving, which causes an increase in the demand for new information from management. It can therefore be assumed that cost accounting is a separate discipline evolving over time, subject to continuous improvement and adaptation to changes occurring in business entities. Although the precise definition of cost accounting remains challenging, its fundamental purpose remains constant. At its core, regardless of the specific tasks it performs, cost accounting seeks to identify the costs incurred by economic units. This information serves as a foundation for decision-making at both operational and strategic levels (Nowak, 2010, p. 29).

In a health care entity, cost accounting functions as a subsystem within the broader accounting information system and serves to calculate the unit cost

of healthcare services and prepare financial statements. Unit cost related information is necessary to determine the total cost of treating an individual patient, a group of patients, or disease units.

The aim of implementing cost accounting is not only to ensure accurate decisions, related to prices set for healthcare and medical services, but also (Hass-Symotiuk, 2010, p. 57):

- to elicit information on unit and total costs of healthcare services provided;
- to determine factors influencing the level and structure of costs;
- to enable accurate decisions related to the allocation of financial resources within the hospital;
- to implement new medical technologies;
- to prepare action plans, etc.;
- to determine the performance of each cost centre and its contribution to the total financial result;
- to control the costs and effects of the activity of individual organisational units or types of activity;
- to examine and evaluate the adequate use of resources at the disposal of the hospital in order to improve the efficiency of its operations;
- to provide economic education of all hospital employees.

Chluska (2011, p. 15) argues that cost accounting is one of the early warning signals for the risk of excessively high costs incurred by healthcare entities. The lack of cost related information is an information gap that hinders decision-making in healthcare entities, leading to, among other things:

- wrong operational and strategic decisions;
- lack of the comprehensive and systemic approach in the information system of a healthcare entity;
- intuitive decision-making by decision-makers, without adequate knowledge of the constraints and opportunities of a healthcare entity;
- no capacity to assess the performance of a hospital and the quality of management in healthcare entities.

In addition, the main objectives of cost accounting set by the Agency for Health Technology Assessment and Tariff System (AOTMiT, 2023) include:

- the standardisation of how information on the costs of healthcare services is identified, collected, processed, presented and interpreted;
- the acquisition by the AOTMiT of structured and high quality cost related data concerning patient treatment process from the highest possible number of healthcare providers, for the purposes of developing tariffs of healthcare services;
- the integration of financial and accounting systems and other IT systems allowing for the monitoring of the adequate use of resources;
- the improvement of management accounting tools at healthcare providers.

The implementation of new cost accounting regulations in healthcare entities in Poland can be approached from a project management perspective. The success of cost accounting implementation relies on both behavioural and organi-

sational factors, e.g. management support, the alignment with the competitive strategy, the connection with performance appraisal and remuneration systems, training, the implementation conducted by accounting staff, and the possession of adequate resources needed for implementation (Wnuk-Pel, 2010). Considering the implementation of cost accounting, it is important to take into account the unique nature of healthcare operations as compared to traditional businesses (Jovanović et al., 2019). However, we should note that this argument on its own cannot be the sole reason for the lack of progress in cost accounting in this area (Cardinaels et al., 2004). In an attempt to identify the most important internal success drivers for implementing the new cost accounting standard, we should mention: people orientation in project management (taking care of their knowledge development, improving their competences, creating an effective motivation system, and ensuring efficient information flow), effective management of relationships with project stakeholders, appropriate employee attitudes and involvement (Walczak, 2010, p. 18). The few studies conducted in this area indicate that the degree to which changes in the area of cost accounting in healthcare entities are approved is positively correlated with the quality of IT, the availability of training, the qualifications of accounting staff, and the support of professional consultants (Eriotis et al., 2011).

The first regulation on cost accounting in healthcare units was the *Regulation on detailed rules of cost accounting in public healthcare units* (1998). This regulation resulted in the need for cost recording, in a way that allows for calculation of unit costs of healthcare services. In compliance with this legal act, the costs incurred by a healthcare institution should be recorded by type and by cost centres from the object-subject angle. The type-based breakdown of cost groups classified costs by type, i.e. consumption of materials and energy, external services, taxes and fees, wages, employee benefits, depreciation, and other costs. Costs from the object-subject angle, on the other hand, are classified by cost centres where they represent a separate scope of activity of a healthcare entity. The cost accounting model presented in this regulation is based on full cost accounting, whereas controlling solutions, in order to bring about a real assignment of responsibility for the performance of particular organisational units to budget managers, should rather take into account the variable cost accounting model. As a result, work has started on developing a new regulation that will meet the above expectation. Accordingly, the *Regulation on detailed rules of cost accounting in public healthcare entities* (1998) was repealed on 01.07.2011.

The solution to the problems mentioned above was another regulation on cost accounting in healthcare entities, namely the *Regulation on recommendations for the cost accounting standard at healthcare providers* (2015), which is based on a resource-process approach.

At a theoretical level, the idea to use cost accounting in hospitals emerged quite a long time ago (Ramsey, 1994). As experiences with the implementation of this approach have repeatedly demonstrated, the design and practical

implementation of activity-based cost accounting is a complex organisational undertaking (Arnaboldi & Lapsley, 2005).

A study carried out in this regard by the Agency for Health Technology Assessment and Tariff System confirmed the difficulties in implementing the *Regulation on recommendations for the cost accounting standard in healthcare providers* (2015). The regulation was repealed as of 20.12.2019.

Further comments regarding problems with the implementation of the cost accounting standard at healthcare providers were included in the *Regulation on recommendations regarding the cost accounting standard at healthcare providers* (2020). The regulation is effective as of 01.01.2021 and it is obligatorily required for healthcare providers who conclude a contract for the provision of healthcare services. The most significant changes concern:

- the unification of the chart of accounts 4 and 5;
- the unification of the allocation keys, the clear definition of management costs components;
- a uniform method of calculating the cost of sales of a given healthcare product;
- a fixed method of calculating the cost of a procedure and a person/day.

3. Methods

The empirical study was conducted in quarter 4 2022 in 52 hospitals in Poland. 19 hospitals are based in the Silesian Voivodeship, 13 hospitals in the Lubelskie Voivodeship, and 12 hospitals in the Podkarpackie Voivodeship. Additionally, three hospitals are based in the Świętokrzyskie Voivodeship, two in the Podlaskie and Małopolskie Voivodeships each, and one hospital in the Zachodniopomorskie Voivodeship.

An important criterion defining the research sample is the type of hospitals according to the division which is the foundation of the so-called hospital network in Poland. Therefore, the surveyed hospitals included 21 level-1 hospitals (40.4%) and 21 level-2 hospitals. The sample includes 8 level-3 hospitals (15.4%), one national hospital and one pulmonology hospital.

41 hospitals (78.9%) have an accreditation certificate confirming that they fulfil quality standards verified by the Quality Monitoring Centre.

The five-point Likert measurement scales used in the empirical study were based on a modified tool developed by Eriotis et al. (2011) and adapted to the realities of the Polish healthcare system and cost accounting standard regulations. In order to assess the reliability of the research tool, Cronbach's alpha coefficient was calculated for each dimension.

Two questions were used (Cronbach's alpha=0.81) for the dimension of the level of knowledge and experience of staff employed in the analysis and cost department (WY). In the area of the use of expert knowledge — WW (Cronbach's alpha=0.67) — three questions were formulated regarding the use of expert knowledge during the design and implementation of the new cost

accounting standard and the preparation of the analysis system that is based on the new cost accounting standard.

In addition, single questions were asked on whether the existing information technology was able to provide the necessary data in terms of the new cost accounting standard (IT1) and to what degree the information systems (IT2) were integrated in various areas (finance and accounting module; cost module; HR and payroll module; warehouse management module, medical statistics module, pharmacy module, etc.).

Another question concerned the relationship of the administrative staff with the medical staff (RP) while implementing the new cost accounting standard. The final question dealt with the provision of adequate training on the design of the new cost accounting standard (WSZ).

The effects of the actions performed with regard to the implementation of the new cost accounting standard were assessed in two aspects:

Assessment of the support of management processes by the new cost accounting standard — WS (Cronbach's $\alpha=0.82$) — 8 statements were used concerning the support of management processes:

- planning processes in the area of setting objectives, policies and courses of action, including the use of budgeting and forecasting elements;
- the collection and preparation of information usually in the form of reports and analyses concerning the functioning of particular organisational units;
- coordination processes concerning analyses and cooperation between units of the healthcare entity (e.g. wards/outpatient clinics and auxiliary organisational units of medical and non-medical nature);
- evaluation processes with regard to employee appraisal, implementation of improvement, assessment of the profitability of medical procedures;
- supervision and internal control processes;
- elements of personnel controlling, in particular within the scope of analyses and forecasts of remuneration costs;
- negotiation processes concerning negotiations with the National Health Fund (NFZ) and internal negotiations conducted within the entity;
- the presentation of the entity's performance in a professional and transparent manner with an appropriate level of detail for different stakeholder groups.

Assessing the feasibility of the application of the new cost accounting standard — WM (Cronbach's $\alpha=0.61$) — 5 statements were used concerning the application of the new cost accounting standard:

- the possibility of the calculation of the cost of treatment of a single medical case;
- the possibility of the reliable assessment of the profitability of individual organisational units;
- the provision of reliable data necessary for the tariffication process conducted by the AOTMiT;

- the possibility of comparative analysis of cost intensity of procedures performed in various healthcare entities;
- the use of cost accounting data and analyses by medical personnel in management processes at the level of selected organisational units (e.g. wards, outpatient clinics).

In research studies, the reliability of measurement tools should exceed 0.7, some authors propose a range of 0.6–0.8, where the value of 0.6 is considered an absolutely borderline standard (Nunnally & Bernstein 1994; Sekaran, 2003). This applies especially to measurements consisting of a small number of statements (Sijtsma, 2009). The level of coefficients demonstrates the consistency of respondents' answers and indicates the relatively high reliability of the measurement tools. Descriptive statistics for individual variables are presented in the Table 1.

4. Results

Multivariate regression models were used to identify the factors influencing the effects of the implementation of the new cost accounting standard in the context of assessing the support of management processes and the feasibility of the application of cost accounting. The models took the following form:

$$Y_i = \beta_0 + \beta_1 WY_i + \beta_2 IT1_i + \beta_3 IT2_i + \beta_4 RP_i + \beta_5 WW_i + \beta_6 WSZ_i + \sum_{j=1}^k \alpha_j X_{ji}, \quad (1)$$

where the dependent variables Y_i were taken to be the summative scores of the variables WS (support of management processes by the new cost accounting standard) and MW (the feasibility of the application of the new cost accounting standard), WY denotes the summative scale for the variable of education and experience of the employees in the analysis and cost department, IT1 and IT2 represent responses to questions on the quality of the IT system, RP regards the relationship between medical and administrative staff, WW denotes the summative assessment of the degree to which expert knowledge is used in the organisation, while WSZ represents responses to questions on training support for the design of the new cost accounting standard. Variables X_j denote control variables including the type of hospital, accreditation, and the logarithm of declared revenue and length of the organisation's life. The parameters of the model α and β were estimated using the classic least squares method, whereas standard errors robust to heteroskedasticity (heterogeneity of the random component) were used to assess the significance of the estimates obtained in the course of the study.

The results are presented in the Table 2. The analysis of the regression models leads to the formulation of the following conclusions:

1. The integration of domain-related IT system modules has an impact on the support of management processes by the new cost accounting stand-

ard (an increase in declared integration by 1 entails an increase of 0.282 on average in the support of management processes by the new cost accounting standard).

2. The use of expert knowledge has an impact on the support of management processes by the new cost accounting standard (an increase in the declared use of expert knowledge by 1 entails an increase of 0.267 on average in the support of management processes by the new cost accounting standard).
3. The assessment of the relationship between medical and administrative staff concerning the implementation of the new cost accounting standard influences the assessment of the feasibility of the application of the new cost accounting standard (an increase in the assessment of the relationship between medical and administrative staff concerning the implementation of the new cost accounting standard of 1 entails an increase of 0.152 on average in the assessment of the feasibility of the application of the new cost accounting standard).
4. The level of education and experience of employees of the analyses and cost department has an impact on the assessment of the feasibility of the application of the new cost accounting standard (an increase of 1 in the declared level of education and experience of employees of the analyses and cost department entails an increase of 0.273 on average in the assessment of the feasibility of the application of the new cost accounting standard).
5. The use of expert knowledge has an impact on the assessment of the feasibility of the application of the new cost accounting standard (an increase in the declared use of expert knowledge by 1 entails an increase of 0.281 on average in the assessment of the feasibility of the application of the new cost accounting standard).
6. In a pulmonology hospital, the support of management processes by the new cost accounting standard is rated on average 0.47 higher than in level-1 hospitals. In contrast, the assessment of the feasibility of the application of the new standard was on average 0.263 higher.
7. The hospital's life has an impact on the support of management processes by the new cost accounting standard (an increase in the declared year of operation of an entity by 1 entails an increase of 0.178 on average in the support of management processes by the new cost accounting standard).

5. Conclusion

The analysis of the research results identifies important factors having an impact on the application of the new cost accounting standard as a result of the proper management of its implementation.

An important element is the use of expert knowledge at the design and implementation stage of the new cost accounting standard and the development of an analysis system that is based on the new cost accounting standard. A key success factor in this respect is direct contact with an expert at the stage of car-

rying out design work in this area, rather than merely attending traditional training courses.

The integration of IT systems towards partial automation of analytical and calculation processes significantly affects the support of management processes as a result of the new cost accounting standard. Primarily, the speed and quality of the information provided influences a number of measures that were mentioned in this respect (eight statements assessing various aspects of the support of management processes).

On the other hand, the assessment of the feasibility of the application of the new cost accounting standard in various aspects of hospital functioning (five statements analysed) is mainly influenced by the knowledge and experience of employees of the analyses and cost department, the relationship between medical and administrative staff concerning the implementation of new cost accounting solutions.

In single-speciality hospitals (a pulmonology hospital in the research sample), the effects associated with the implementation of the cost accounting standard seem to be relatively easier to achieve compared to other types of hospitals due to the consistent profile of the entity and the lower complexity of the implementation. The hospital's life positively influences the support of management processes by the new cost accounting standard. This is probably due to well-established mechanisms in the area of accounting and management accounting, which can facilitate the implementation process of new solutions by providing a good starting point. In addition, it was shown that accreditation certification is not a factor that has an impact on the success of the implementation of the new cost accounting standard. In consequence, it can be concluded that quality-related maturity does not affect process maturity in the implementation of financial and management accounting processes.

The study on the implementation of the new cost accounting standard identified key factors for success in managing the implementation of this solution, including its impact on supporting management processes and the feasibility of its practical application. By proactively managing this process and paying attention to the key success factors in this area, the expected benefits affecting effective hospital management can be achieved. Future research in this area may concern the level of maturity of the applied cost accounting system pursuant to the new regulations (Raulinajtys-Grzybek et al., 2019) due to the relatively short period of its implementation in Poland.

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Appendix

Table 1.
Descriptive statistics for the variables investigated in the study

Variable	Mean	Standard deviation	Min	Max
WY	3.769	0.546	3.0	5.0
IT1	3.865	0.627	2.0	5.0
IT2	4.019	0.464	3.0	5.0
RP	2.962	0.885	1.0	4.0
WW	3.199	0.790	1.0	5.0
WSZ	3.192	0.908	1.0	5.0
WS	3.428	0.504	1.6	5.0
MW	3.208	0.436	2.4	4.6

Source: Own preparation.

Table 2.
Regression model

	Assessment of support of management processes by the new cost accounting standard (WS)	Assessment of the feasibility of the application of the new cost accounting standard (MW)
WY	0.1640 (0.1420)	0.2730*** (0.0959)
IT1	0.1440 (0.1040)	-0.0715 (0.0967)
IT2	0.2820** (0.1220)	0.1490 (0.1270)
RP	0.0353 (0.0905)	0.1520** (0.0650)
WW	0.2670** (0.1170)	0.2810*** (0.0775)
WSZ	-0.0026 (0.0725)	-0.0216 (0.0603)
Type of hospital (base: Level-1 hospital)		
level-2 hospital	0.2200 (0.1340)	-0.0032 (0.1140)
level-3 hospital	0.3770 (0.2970)	0.1710 (0.2500)
pulmonology hospital	0.4700** (0.1880)	0.2630* (0.1350)
national hospital	0.2160 (0.2920)	-0.0364 (0.1890)
Accreditation (base: Yes)		
no	0.1270 (0.1630)	0.0367 (0.1120)
ln(Revenue)	0.1080 (0.2180)	0.0809 (0.1190)



	Assessment of support of management processes by the new cost accounting standard (WS)	Assessment of the feasibility of the application of the new cost accounting standard (MW)
ln(Life)	0.1780* (0.1050)	-0.0508 (0.0620)
constant	-1.1010 (1.6720)	0.3850 (0.9590)
N	52	52
R ²	0.5270	0.5960

Notes:

Robust standard errors are provided in brackets; *** p<0.01, ** p<0.05, * p<0.1.

Source: Own preparation.