

Hospital managers' participation in operational planning: insights from a recent study in the Greek National Health System

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Abstract

Background: The performance of the public hospitals of the National Health System (NHS) of Greece, as reflected in their financial and operational results, is related to their strategic planning and the factors that influence the accomplishment of their objectives.

Method: The organizational performance of NHS hospitals was assessed by analyzing their operational and financial data for the period 2010-2020 (recorded by the "BI-Health" system of the Ministry of Health). Based on internationally accepted factors that influence the successful implementation of strategic planning and the achievement of its objectives, a structured questionnaire consisting of 11 demographic and 93 (on a scale of 1 to 7) factor-related questions was developed and addressed to 56 managers and senior executives. Their response was analyzed using descriptive statistical methods and inference, and "significant" factors were extracted using Principal Components Analysis.

Results: Hospitals reduced their expenditure from 2010 to 2015 by 34.6 %, while the number of inpatients increased by 5.9 %. However, expenditure increased by 41.2 % in the period 2016-2020, while concurrently, inpatients rose by 14.7 %. Outpatient and emergency department visits remained almost stable (6.5 and 4.8 million/year, respectively), during 2010-2015, while increased by 14.5 % till 2020. The average length of stay decreased from 4.1 in 2010 to 3.8 in 2015 and 3.4 in 2020.

The survey data showed that NHS hospitals' strategic plan is well "documented", but its "actual implementation" is moderate; The "achievement of the objectives" related to clinical work, quality improvement of services, human resources development, financial strategy, asset strategy, digital strategy, communication and engagement strategy, and research might be good; chief executive officers, nurses, laboratory physicians, and administrators receive a positive grade of participation while the Board of Directors, physicians, employee representatives and the School of Medicine/University receive a moderate grade.

The factors: "elements of strategic planning" (33.6 %), "evaluation of services and staff" (20.5 %), "employees' commitment and involvement" (20.1 %), and "operational outcomes and performance" (8.9 %), as derived from the principal component analysis, had the highest impact on achieving their financial and operational objectives, as assessed by the views of the managers of the 35 NHS hospitals.

Conclusion: The NHS hospitals increased their efficiency from 2010 to 2020 but failed to maintain control over their expenditure. Through their clinical managers and other employees' representatives, chief executive officers and the Board of Directors need to improve planning formulation, staff involvement and utilization, financial performance, and outcomes as their primary commitment among health policy and management sectors in the Greek NHS. HIPPOKRATIA 2022, 26 (3):91-97.

Keywords: Greece, National Health System, hospitals, strategic planning, health policy, management, operational efficiency

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Introduction

During the period 2010-2020, various studies were conducted to evaluate the operation of the Greek National Health System (NHS) hospitals, examining mainly quantitative and qualitative parameters of their operation while taking into account the various restructurings and reforms of the public hospital sector¹⁻⁷. The NHS sector in

Greece consists of 83 main hospitals and 53 interconnected to the main (2012). Total beds are 36,441, inpatients per year 2,160,595, the average length of stay 3.4 days, occupancy rate 59.7 %, doctors 11,479, nurses 35,467, rest staff 34,362, non-salary expenses €2,409 million (2020), pharmaceutical expenditure 977 million. (ESY. net - Bi Health System Ministry of Health).

A study showed that the average Malmquist Productivity Index score of the NHS hospitals was 0.72, while 91 % of the hospitals scored below one⁴. Indicators such as financial and productive efficiency for general hospitals were 72 % and 79 %, respectively, calculated by bootstrap Data Envelopment Analysis in 2010¹. Significant productivity improvements were found in large-sized (>400 beds) and medium-sized (100-399 beds) hospitals in contrast to small (<100 beds) hospitals which did not achieve significant increases². The performance of 90 Greek general hospitals was associated with initiatives or strategies adopted to improve their efficiency. Among these were team management and teamwork, the development of professional rules and codes of ethics, the rationalization of operating costs, demand-driven restructuring of hospital services, and the provision of patient-friendly services⁵. Patients perceived that the service quality of public hospitals was at a moderate level (on a scale of 1 to 100: 66.2) in the period 2007-2014, showing, during the recession, a downward trend, concluding that the cut in public spending on hospital care in Greece had a negative impact on the perceived output of care despite the positive impact on the budgets of Greek public hospitals⁸.

A key component for the organizational success and high performance of Greek NHS hospitals, such as strategic and operational planning, and the factors that affect it are not often mentioned. A positive relationship between performance and strategic planning is reported by many studies^{9,10}, while others argue that no such relationship exists^{11,12}.

Most research in healthcare regarding strategic planning is limited to small samples and case studies and does not correlate strategic planning to organizational performance¹³⁻¹⁵. Recently, the relationship between the organizational performance and strategic planning of Texas hospitals was evaluated and reported a positive result¹⁶. In contrast, cancer centers that developed strategic control approaches had better financial performance than those that did not¹⁷. The changing external environment (economic fluctuations, demographic and epidemiological changes, public and political expectations, etc.), changes in the health care system (e.g., health care markets, costs, technologies, patient demands, and regulations), and problems faced by health care personnel continually affect service quality^{18,19}.

A study by Mohammadkarim Bahadori et al in 2018, with the use of Interpretive Structural Modeling, argued that five key factors influence the implementation of the strategic plan in a hospital: “the awareness and involvement of senior managers in the strategic planning process”, “the creation and maintenance of team participation in the strategic planning process”, “the participation and involvement of employees in the strategic planning process”, “the organizational structure”, and “the culture of the organization”. The former two factors had the highest driving force, while the latter two had the highest dependency power²⁰. They demonstrated that, unlike the

top-down strategy formulation process, strategy implementation could not be achieved by managers alone but requires the cooperation of all employees²¹. Implementing a strategic plan will not take place on its own in a hospital, and staff must pay attention to factors that affect its implementation and remove barriers²².

The present study attempts to identify, analyze, and evaluate the existence and the degree of implementation of the strategic planning of the NHS hospital units, consequently, the factors that influenced it, and their impact on the operational and financial results as these have been evaluated by the various key performance indicators and presented in the relevant literature of the 2010-2020 period.

Materials and Methods

Initially, the hospitals' organizational performance was evaluated by collecting and analyzing their operational and financial data for the decade 2010-2020 as captured by the BI Health system of the Ministry of Health. The data collected regarding the identity of each hospital and its operational and financial development were systematically entered in electronic format in spreadsheet files and processed using the IBM SPSS Statistics for Windows, Version 20.0 (IBM Corp., Armonk, NY, USA) software after being classified according to hospital type/size. The descriptive statistics methods (mean, standard deviation, median, range for each variable) and various statistical inference tests (χ^2 , F-test, student's t-test) were used to analyze the data and draw conclusions.

Time series of hospital productivity indicators such as nursing traffic, outpatient attendance [outpatient clinics, intensive care unit (ICU), day-care], number of surgeries, etc.; the evolution of hospital expenditure by category (medicines, materials, orthopedic material, reagents, etc.) by type and size of a hospital; the average length of stay (annual days of hospitalization/annual number of admissions); average bed occupancy (annual days of hospitalization *100/annual number of beds *365); average cost of hospitalization (total operating cost/annual number of admissions); daily hospitalization costs (total operating cost/annual days of hospitalization); mean revenue per bed (total revenue/number of beds); average cost per bed (total operating cost/number of beds); the development of human resources (staff) were created and combined with elements of health's strategic planning of the 2010-2020 period.

The empirical relationship between organizational performance and strategic planning was assessed by testing a series of hypotheses concerning the possible factors affecting the success of its implementation in relation to the financial (revenue-expenditure) and performance (coverage per bed, etc.) aspects of the hospitals.

The factors under investigation that possibly could influence the success of strategic planning implementation were: i) the existence or not of a strategic plan over at least a three-year period and an operational plan with developed individual objectives, timetables, budget,

stakeholders, etc., ii) the degree of development and implementation of the strategic plan, iii) the existence of formulation and monitoring committees, iv) the degree of involvement of stakeholders (management, Board of Directors, medical service, etc.), v) the communication within the internal and external environment of the hospital, vi) the degree of commitment of the stakeholders to the implementation of the objectives, vii) the degree of achievement of the objectives in the different areas, and viii) the evaluation of present objectives and setting new ones.

The above factors were chosen based on the analyses of researchers in the international literature. These questioned the necessity of the existence and implementation of a strategic plan and its relationship with the hospital's financial performance, as well as the main factors that influence its implementation whose "driving force" (impact factors) is calculated using various strategy tools and models^{9-15,17,18,21-26}.

Their investigation was conducted utilizing a questionnaire (structured by a scientific committee) whose compilation, content, and analysis were based on the data presented in the international literature (introduction) and based on the literature review²⁷⁻³⁰.

The questionnaire was addressed to hospital managers and senior executives, and was used to analyze the design and implementation issues of the hospitals' strategic planning. Objectives, stakeholder involvement, monitoring, evaluation and review, evaluation of management and other systems, as well as the link between strategic planning and financial and operational results were among the topics included in it. Similar questionnaires were applied in respective studies addressed to hospital chief executive officers in Minnesota, San Antonio, Texas, and Wisconsin, USA, as well as to hospital managers in Iran and in hospitals in Lebanon and Jordan^{16,27,29-32}.

The survey was conducted in a stratified random sample of 35 out of the total 124 NHS public hospitals in Greece. The questionnaires were personal and were filled out online by the respondents. Each respondent was provided a unique code (token) via e-mail, linked to the questionnaire, available through a statistical survey web app named Lime Survey. A total of 118 questionnaires were sent, out of which 58 were completed (response rate 49.2 %), while two questionnaires were excluded from the analysis for being incomplete.

To complete the questionnaires, systematic and persistent reminders (follow-up) were needed to the hospital executives by e-mail or telephone. On many occasions visiting the hospitals and communicating with them in person was necessary as, despite the assurances of confidentiality, they were rather reluctant to complete the questionnaires. To clarify this, it should be acknowledged that, in addition to issues related to the general culture of employees' contribution to research, evaluation of organizations and services provided, during the survey period, the hospitals were operating under the regime of dealing with the Covid-19 pandemic, which significantly bur-

dened the already stressful hospital work environment.

The sample represented executives from all types and sizes of hospitals (General and University hospitals, General Hospitals/Health Centers, Pediatric, Oncology, Specialist, and Psychiatric). The questions were analyzed using statistical data analysis software (IBM SPSS Statistics for Windows, Version 20.0). The questionnaire consisted of questions with pre-selected answers (for ease of completion). The scale used for the questions related to the existence of different factors is Yes/No, while the 1-7 Likert scale was used for assessing the different factors.

The validity of the questionnaire and its internal consistency reliability were assessed using Cronbach's α coefficient, calculated for each of the question groups. The degree of responses was statistically tested for probabilistic significance in relation to the hospital population (t-test). Descriptive statistics such as means and standard deviations were calculated for each item in the questionnaire. A mean score between three and four represented an average degree of success.

Factors influencing the successful implementation of strategic planning and their extent of influence were investigated using principal component analysis. An attempt was also made to create linear models from which the coefficients of factors' impact on specific questions were derived (e.g., which factors and to what extent do they influence the success of a hospital's strategic plan?)

The results of the analyses, together with the evolution of a summary of hospital financial and operational indicators for 2010-2020, and the factors that influenced the implementation of their strategic and operational planning are presented below.

Results

Hospitals managed to significantly reduce their expenditure in the period 2010-2015 (-34.6 %) but not in the period 2016-2020 when expenditure increased (+41.2 %). The number of inpatients increased by 5.9 % between 2010 and 2015, while outpatient and emergency department visits remained almost stable (6.5 and 4.8 million/year, respectively). The average cost of hospitalization decreased by 38.3 % from €1,252.2 in 2010 to €772.9 in 2015, while the average cost per day of hospitalization decreased by 31 % from €294.9 to €203.5 (ESY.net - Bi Health System Ministry of Health).

The years 2016-2020 were characterized by a continuous increase in hospital productivity until 2019. The number of inpatients increased by 14.7 %, outpatient admissions by 14.5 %, and the number of after-hours visits by 18 %. However, in 2020, due to the Covid-19 pandemic, hospital admissions decreased by 15 %, admissions to emergency departments by 35.4 %, ICUs by 32.2 %, and after-hours visits by 35.5 %. Total expenditure increased by 41.2 %, reaching €2.4 billion in 2020. Pharmaceutical expenditure was "doubled" from €489 million in 2015 to €977 million in 2020, while materials expenditure increased by 38.8 % from €304 to €422 million (ESY.net - Bi Health System Ministry of Health).

The average length of stay decreased from 4.1 in 2010 to 3.8 in 2015 and 3.4 in 2020, while statistically significant differences in the average length of stay were found between the different types of hospitals (F-test =30.03, $p < 0.001$; Table1). Ultimately, the average hospitalization cost per patient increased by 44.2 % from 2015 to 2020.

Throughout the decade 2011-2020, the mean revenue per bed and the average cost per bed show an increasing trend as a result of the reduction of beds due to hospital mergers and the increase in expenditures in the period 2016-2020.

Survey Results

The degree of documentation, framing, and development of the hospitals' strategic plan was reported to be good (mean >4), but not the actual level of implementation, which was moderate. Testing the significance of the mean value score (4.80; Figure 1; Table 2) for the question "To what extent do you consider that there is a well-documented strategic plan?", we concluded that the degree of documentation of the strategic planning was "good" (t-test: 3.45, $p = 0.001$).

The achievement of the objectives related to clinical work, quality improvement of services, human resources development, financial strategy, asset strategy, digital strategy, communication and engagement strategy, research, and the degree to which all stakeholders (patients, their families, staff, politicians, etc.) benefit from the achievement of the strategic objectives was good. Staff engagement in the implementation of the strategic planning objectives was also good, except for the medical staff, which was marginal. Communication of the main strategies to the internal and external environment of the hospital was also marginally good. The support of the strategic planning by methodological tools such as SWOT and PESTEL analyses, market analysis, and

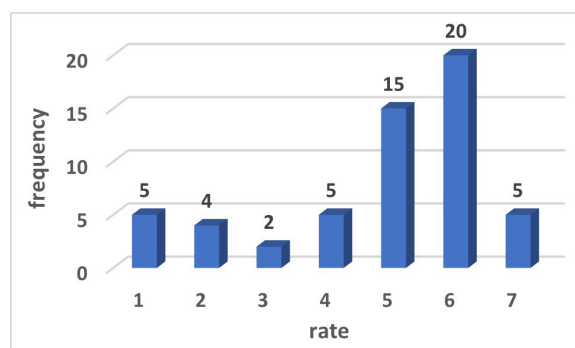


Figure 1: Bars graph presenting the frequency of responses to question 13: "To what extent do you consider that there is a well-documented strategic plan?"

benchmarking of the hospital with other hospitals and the existence and achievement of a roadmap with clearly timed individual objectives leading to the achievement of the strategic plan objectives was moderate.

The level of engagement of the strategic planning committee was significantly below average. Regarding the degree of participation, chief executive officers, nurses, laboratory physicians, and administrators received a positive grade, while the Board of Directors, physicians, employee representatives, and the School of Medicine/ University received a moderate grade. The linkage between the strategic planning objectives and the Hospital Budget was moderate. The perceived degree of the link between staff appraisal and strategic planning was moderate. The assessment of the strategic planning objectives, as reflected by a series of questions in the questionnaire, was moderate.

Finally, assessing some general issues of the hospitals gave us the following interesting results. The degree that the funding meets the needs of the hospital was moderate.

Table 1: The average length of stay per hospital type and its variance, and Analysis of Variance (ANOVA) regarding the Greek National Health System public hospitals for the period 2010-2020.

Type of Hospital	Count	Average length of stay / patient (days)				
		Sum	Average	Variance		
General	87	310.0954	3.564315	5.250075		
Health Center	17	50.01706	2.94218	0.894479		
Specialist	4	20.25878	5.064694	34.87376		
Oncology	4	8.618989	2.154747	0.118717		
Children	4	10.16367	2.540917	0.272819		
University	7	20.60136	2.943051	0.098347		
Psychiatric	3	61.83232	20.61077	9.086484		
ANOVA						
Source of Variation	SS	df	MS	F	p value	F crit
Between Types	893.7937	6	148.9656	30.02642	1.04E-21	2.175659
Within Types	590.3771	119	4.961152			
Total	1484.171	125				

ANOVA: Analysis of Variance.

Table 2: Descriptive statistics regarding responses to question 13: “To what extent do you consider that there is a well-documented strategic plan?”

Number of answers	Mean value of the answers	Median value of the answers	Minimum value of the answers	Maximum value of the answers	Standard error of the Mean	Standard Deviation
56	4.80	5.00	1	7	0.233	1.742

The degree regarding the assessment of staff adequacy was good. The grade on the assessment of the evaluation of management systems was good. The score for the assessment on the evaluation of the services offered and technologies used was moderate.

Factors shaping the strategic planning

Four main factors (latent variables - groups of variables related to the same underlying factor) were identified by the Principal Component Analysis that explain the 83.1 % of the variance in the data (Table 3).

The factor “strategic planning elements” with elements relating to the degree of formulation of the main strategies, the existence of a well-documented strategic plan, the degree of its development and actual implementation, the role of the Governor, communication, etc. had the highest impact 33.64 % as a percentage of the total variance of the data; followed by the factor “evaluation of services and staff” with data relating to the evaluation of the services provided and the technologies and systems used with 20.48 %; the factor “commitment and involvement” with data concerning the participation of doctors, nurses, workers’ representatives, the Board of Directors, etc. with 20.14 % and “outcomes and performance” which is the factor of financial and operational results of hospitals with 8.85 % only.

Discussion

The hospitals implementing strategic planning adapted to the financial situation of the period 2010-2020 managed to reduce their costs while increasing their productivity. Our study showed that the degree of documentation, framing, and development of the hospitals’ strategic plan was good (mean value >4). However, the actual level of implementation was moderate, showing difficulty in implementing the operational plans.

A similar study concluded that the hospitals’ strategic plans were moderately developed and implemented²⁹, and yet another hospital study reported that “nearly 70 % of healthcare organizations had strategic plans complying to related request and not because they felt the need to do so” and concluded that strategic plan implementation without organizational structures, culture, and processes upgrading, may result in less performance improvement and strategic plan early abandon³⁰.

The “factors” that had a major impact (83.1 %) on the degree of achievement of the strategic planning objectives of the hospitals were:

a. “elements of strategic planning” consisting of elements such as the existence of a well-documented strategic plan (SP), the degree of its development and actual

implementation, the role of the Governor and the administrative department, as well as the internal and external communication of the SP and its link to the hospital’s budget,

b. “evaluation of services and staff” consisting of elements such as the evaluation of services provided and technologies used, evaluation of the objectives of the SP, evaluation of managers based on achievement of objectives, and evaluation of management systems to monitor the hospital’s objectives,

c. “commitment and involvement” consisting of elements such as the participation of physicians, nurses, laboratory personnel, employee representatives and the Board of Directors in the SP processes were included,

d. “outcomes and performance” consisting of elements such as data regarding the financial and operational results of the hospital as reflected by the mean revenue per bed.

The strategic planning of the NHS Hospitals in Greece during the decade 2010-2020 was a top-down process in which hospital administrations were called upon in the context of structural changes combined with the pressure exerted by the provisions of the Memorandum. They aimed to achieve immediate results by directing their operational planning mainly to serve the objectives of efficient operation and rationalization of funding.

The degree of achievement of the targets, despite the generally positive attitude, was not the same for all hospitals. The administrations that performed better on the factors influencing strategic planning, i.e., they were able to engage managers and staff in the implementation of the objectives, ensured their participation in implementation planning, objectives evaluation, and redefinition; those that had good communication in the internal and external environment and highlighted the benefits to stakeholders, achieved better results.

The negative picture of the hospitals’ financial results in the period 2016-2020, despite their improved performance, arises from a shift implemented by the Ministry of Health’s strategic objectives focusing on interdisciplinary changes (TOMY, Primary Care, etc.) and relaxing the objectives at the hospital level. However, this should trigger further study of the organizational culture model of hospitals’ strategic planning and their relationship with the Ministry of Health.

This study was the first attempt to take a holistic approach to evaluate Greek NHS hospitals during the decade of various crises and reforms. A possible restriction is that the hospital executives’ opinion was captured when the response to the Covid-19 pandemic influenced the strategic planning of hospitals. Capturing the opinion

Table 3: Principal Component Analysis - Table of factors and their main elements.

Rotated Component Matrix ^a					
	elements of the factors	Component			
		1	2	3	4
FACTOR: "elements of strategic planning"	Estimated degree of definition of the main strategies that form the framework of the strategic plan (Q18)	.899			
	Involvement of the Commander	.853			
	Estimated degree of existence of a well-documented strategic plan (Q13)	.852			
	Estimated degree of development of the hospital's strategic plan (Q14)	.823			
	Achievement of objectives	.797			
	Estimated extent to which the hospital's strategic plan is actually being implemented (Q17)	.775			
	Involvement of the Administrators	.753		.465	
	Communication	.697	.473		
	Budget & Strategic planning	.629	.520		
FACTOR: "evaluation of services and staff"	Evaluation of technology		.841		
	Target Evaluation	.423	.830		
	Staff assessment	.404	.783		
	Systems Assessment		.763		
FACTOR: "commitment and involvement"	Participation of Nurses			.858	
	Participation of Laboratory personnel	.404		.821	
	Participation of physicians	.446		.780	
	Participation of employee representatives		.436	.775	
	Participation of the Board of Directors		.503	.603	
FACTOR: "outcomes and performance"	Mean revenue per bed				.895
	Average bed occupancy				.847

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization. a: Rotation converged in 5 iterations.

of hospital managers on their strategic planning could be conducted both at a hospital level, taking into account the opinion of all employees, and at a level of similar groups of hospitals to draw comparative and more detailed conclusions, which would require a much larger number of questionnaires.

Patients' opinion on the health services they receive is an important factor in shaping the strategic planning of hospitals. Therefore, its weight in achieving strategic planning objectives should be regularly reflected.

Finally, because this study is a cross-sectional (hospital) view of the changing healthcare system in Greece and is a dynamic method, this process requires updating every 3-4 years to match the ever-changing situation. Thus, the impact of different health policies on the implementa-

tion of hospital operational and strategic planning should be a subject of future studies.

Conflict of Interest

The authors declare no conflict of interest. No specific grant was received from funding agencies in the public, commercial, or not-for-profit sectors.

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