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INNOVATIVE APPROACHES IN MANAGEMENT: A KEY FACTOR FOR THE QUALITY OF HEALTH SERVICES*

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Abstract. The aim of the study is to examine whether the use of innovative approaches in management of health care facilities is related to a higher overall rating of these facilities and whether this connection is supported by information sharing and the climate in the organization, expressed by soft management tools. The Baron and Kenny's mediator model was used for testing the correlations and the Sobel test for determining the mediator effect. A series of regression analysis were used to identify the proposed hypotheses. Incomplete mediation was found with a 57% share of the total effect in the form of a direct effect and a 47% share of the total effect in the form of an indirect effect. Both effects have been shown to be significant. The overall rating of a device can be influenced by innovative management approaches and amplify its effect through information sharing. The climate in the organization did not prove significant in our study. From the innovative approaches, most contribution to the overall rating of hospitals provided its innovations in strategic management and planning, where the coefficient of increase in evaluation was the highest in the unit change of both items. Innovative approaches in management, information sharing and also climate support in organizations are more significantly implemented in hospitals - joint stock companies, belonging to the network of hospitals, which strives within this network for efficient and effective implementation of management tools.

Keywords: Innovative management; management; healthcare; quality of health services

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1. Introduction

The health systems of developed countries are currently facing many challenges. These are the challenges of managing patients with chronic diseases, the challenges of technologically advanced, comprehensive and costly treatment, the growing societal expectations of the healthcare system and many more that are constantly increasing the need for effective management and quality healthcare (Spehar et al., 2012). Last but not least, it is the current difficult crisis situation related to the Covid-19 pandemic. Top managers of individual healthcare facilities should be able to proactively respond to these challenges with many innovative management tools and then transform strategic goals into internal management processes with appropriate implementation tools to ensure the high quality of healthcare provided at cost-effective costs. Given the fact that most managers in health care are also highly specialized medical professionals, it is not surprising that in professional and scientific circles are constantly discussing their sufficient, respect. insufficient managerial competencies. Problems with the management of healthcare organizations have been documented by many articles, studies, research, which we do not consider surprising given the specificity and complexity of these systems. Managing a medical facility is no longer just about highly professional medical knowledge. The managerial skills of top health care managers are increasingly being discussed, as well as their insufficient level compared to the business sector (Ackerly et al., 2011; McCallin & Frankson, 2010; Townsend et al., 2012; Warren & Carnall, 2011). Authors Pihlainen, Kivinen and Lammintakanen (Pihlainen et al., 2016), Enterkin et al. (Enterkin et al., 2013) and Yoder-Wise (Yoder-Wise, 2014) point out, that not only to the lack of basic managerial knowledge and skills, but especially to the lack of an innovative approach in management in the form of various modern tools and techniques offered by current management theory. Kuhlmann et al. (Kuhlmann et al., 2013) emphasize the need for innovative approaches in management of health organizations within the so-called "Hybridization" of the relationship between medicine and management.

A study by Cook and Bartram (Cooke & Bartram, 2015) states that given the general pressures to reduce costs and the need for high-quality care in the healthcare sectors, effective management in healthcare organizations is critical, with the authors seeing the problem mainly in aligning care ethics with business efficiency and in the invasion of performance culture into management itself. Identification of weaknesses in the management of health organizations are also innovative forms of communication due to the hierarchical limitations of organizational culture (Mesfin et al., 2020) and the related lack of opportunities (Cooke & Bartram, 2015) in human resources management and lack of situational leadership, which allows the use of different leadership styles such as clinical, servant, compassionate, diverse and others, suitable for the environment of medical teams (Dickinson et al., 2013; Kuhlmann & von Knorring, 2014). Constantly and continuously discussed area remains patient-oriented human resource management for reducing fluctuation and stabilization of job satisfaction, quality working conditions, safety, but also professional development and training, which is essential in this sector (Avgar et al., 2011; Cooke & Bartram, 2015; Dahlke et al., 2018; Martinussen et al., 2020). The loss of well-performing specialist professionals is costly for hospitals, and therefore their fluctuation is a critical issue in healthcare systems around the world (Kroezen et al., 2015). The authors confirmed a statistically significant relationship between the competencies of health leaders and the lower probability of intention to quit. Von Knorring et al. (Kuhlmann & von Knorring, 2014) point out in their study the weak informal position of managers / physicians in a healthcare organization compared to a physician expert and found that many healthcare managers struggle with this discrepancy and are unsure, due to insufficient managerial skills, to assume their managerial role. The authors see this as a major problem in the management of healthcare organizations, regardless of whether the manager is a doctor or not.

In the Slovak Republic, the non-governmental and non-profit organization INEKO Institute, which supports economic and social reforms in the country, implemented a project to evaluate Slovak hospitals on the basis of 16 criteria documenting their quality. With this evaluation, hospitals are presented in the Slovak ranking of medical facilities, which not only increases their external image, but also points to functioning internal systems in the best-rated hospitals (Institute for Economic and Social Reforms, INEKO). This encourages researchers to examine the factors that give some facilities priority in many criteria relating not only to the quality of services provided, but also to patient satisfaction or facility management, and to contribute to the complex issue of effective health management. There is a significant research gap here, which is the basis of our research model.

The aim is to examine whether the use of innovative management approaches (IA) is linked to a higher overall rating of healthcare facilities and whether this link is supported by information sharing and the climate in the organization, expressed in soft management tools. Our first effort is to explore the relationship between innovative management tools and the performance of healthcare facilities. The performance of the facility is expressed by the index "Overall Rating" (OR), which is reported in the Slovak Republic in 44 healthcare facilities for the years 2015 to 2019 as one indicator, expressing the position of the hospital in the Slovak ranking of hospitals. The OR contains 16 sub-items, which are evaluated in two main areas - medical (quality of services provided, experience, difficulty of diagnoses) and non-medical (patient satisfaction, management, and transparency). It is prepared and published by the INEKO Institute. Secondly, it is our intention to examine the mechanism by which the use of innovative approaches affects the performance of equipment. Within this mechanism, we focused on management tools that largely influence the implementation of changes, new approaches or modern management tools in the organization and to the organization's climate (CO) and information sharing (IS).

2. Theoretical background

Research in the management of health services is increasingly shifting to the search for factors influencing organizational performance, focusing on organizational management and management practices as important factors (Denis & Van Gestel, 2016; Lega et al., 2013; Tsai et al., 2015). At the same time, given the rapid development of management as a science, stronger views on the need for managerial education of health leaders and their continuous acquisition of knowledge about modern management trends (Flaig et al., 2020; McAlearney, 2008; Sonnino, 2016). Savage et al. (Savage et al., 2020) add that the improvement of their managerial knowledge and skills have a positive impact on the quality of care, the management of financial and operational resources and social performance. Positive effects of using soft management tools of doctors in management positions on employee satisfaction (Menaker & Bahn, 2008) and their stabilization or psychological safety were found (Shanafelt et al., 2015). Shipton et al. (Shipton et al., 2008) present with their findings a positive relationship between innovative leadership and hospital performance. We understand innovative leadership not only as leadership in relation to the internal environment, ie employees, but also towards external stakeholders. In this context, working on patient satisfaction through appropriate employee leadership styles has great importance (Collinson, 2006; Kristensen et al., 2016). The influence of leadership on hospital performance is also presented in a study by Sarto and Veronesi (Sarto & Veronesi, 2016).

Many authors focus on the influence of hard management factors on the performance of healthcare facilities (strategic management, planning, organizational structures, quality, control, etc.). Sunol et al. (Suñol et al., 2009) demonstrated a positive impact of quality strategies on hospital outputs. Johannesen et al. (Johannesen et al., 2020) found that external assessment programs, such as certification, accreditation, may support resilient performance in healthcare by nurturing the potential to respond and learn. Nabitz et al. (Nabitz et al., 2006), Van Schoten et al. (van Schoten et al., 2016) examined the implementation of the EFQM quality model. Their results show that the use of the EFQM model in hospitals is associated with improved organizational performance in the longer term. Best practices of total quality management implementation in health care settings and their

connection with organizational performance are presented by Talib et al. (Talib et al., 2011). Lindskog, Hemphälä & Eriksson (Lindskog et al., 2017) pointed out the importance of the Lean management concept in promoting individual innovation in Swedish healthcare, but assuming the implementation of soft management tools.

The growing importance of networks in health care as integrative and interdisciplinary tools that support coordination between service providers, improve their quality and other performance indicators through shared leadership, shared vision, transparent communication (Brown et al., 2016; Cunningham et al., 2012; Sibbald et al., 2020). As part of control, new tools are being promoted in the form of complex control systems that will be able to measure various aspects of performance (Fanelli et al., 2017).

The use of hard and soft tools simultaneously is being addressed by Campbell et al. (Campbell, 2020) in innovative change management in healthcare organizations, transforming the 8 steps of John Kotter's change management model (Kotter & Cohen, 2012) into the healthcare environment and its specifics.

Based on the above mentioned statements, we formulate the first hypothesis:

H1: We assume that the use of IA in management of healthcare facilities is related to their overall rating (OR).

IS is a critical process because if information is not shared and adapted in team processes, then individual resources remain underused in implementing innovative approaches (Moser et al., 2019; Srivastava et al., 2006; Vainieri et al., 2019).

IS is a tool for management that ensures individual and team performance by acquainting employees with the vision, mission and goals of the organization, through clear, timely, regular information about current issues and facts, new intentions and opportunities (Fanelli et al., 2017; Moser et al., 2019; Vos & Buckner, 2016). Only informed employees can contribute to the implementation of changes related to the implementation of innovations in the organization (Pfeffer, 2010). Aragon-Correa et al. (Aragón-Correa et al., 2013) even point to a direct link between practices that promote IS and organizational innovation. Gibson et al. (Gibson et al., 2007) and Roohi et al. (Roohi et al., 2020) point to the important contribution of IS to organizational performance and at the same time confirmed in their research that IS has a unique place among different management practices.

Information sharing is also presented in the context of outcome variables such as improving the quality of health services, reducing costs, increasing patient satisfaction, etc. (Bodenheimer & Sinsky, 2014; Hussey et al., 2013; Storkholm et al., 2017).

H2: We assume that the use of IA in management of healthcare facilities is related to IS.

H4: We assume that IS is related to the OR of the healthcare facility.

The climate represents the atmosphere that prevails in the organization. It is a surface variable in contrast to organizational culture, which extends into deeper organizational layers and is long-term resistant to various interventions. The climate is a relatively less stable layer, it is relatively easy to intervene with immediate measures. The climate is manifested by a collective consensus on certain aspects of the functioning of the organization. These are ways of communicating, focusing on common values, ensuring employee well-being, opportunities for innovation, incentive systems or leadership styles (Savage et al., 2020; Shipton et al., 2008). The authors point out the important links between climate and the results of hospital performance and emphasize that better results in achieving higher quality of health services are achieved in organizations where a collective

consensus of patient-oriented services prevails. An important finding of their study is the mediation effect of care quality climate on outcome variables of facilities. IA require an innovative climate in which employee behavior, incentive systems, teamwork and other aspects of the climate are innovatively oriented, encouraging and supporting innovation (Moser et al., 2019).

Given the evidence-based studies on the supportive effect of CO in implementing various changes in organizations, especially through the mechanism of shared values (Shipton et al., 2008; Spurgeon et al., 2015), job satisfaction of employees (Cambré et al., 2012; Hargadon & Bechky, 2006; Hong et al., 2019; Chen et al., 2020; Lamberti et al., 2020; Wang et al., 2014; Wombacher & Felfe, 2017), we are inclined to believe that innovative management practices will be transformed into the work environment by creating a favorable CO.

A favorable and pro-innovative CO is a tool that contributes to increasing employee loyalty (Flory et al., 2014), trust (Nedkovski et al., 2017), increasing employee performance (Boğan & Dedeoğlu, 2017), job satisfaction (Abdolshah et al., 2018) and the performance of the organization as a whole (Ali et al., 2018).

H3: We assume that the use of IP in management of healthcare facilities is related to the climate in the organization (CO).

H5: We assume that the climate in the organization (CO) is related to the overall rating of the healthcare facility (OR).

The aim of the paper is to verify the hypothesis of a positive relationship between **the use of innovative approaches in management of healthcare facilities and the overall rating of the facility, which is mediated by the organization's climate and information sharing** (Figure 1).

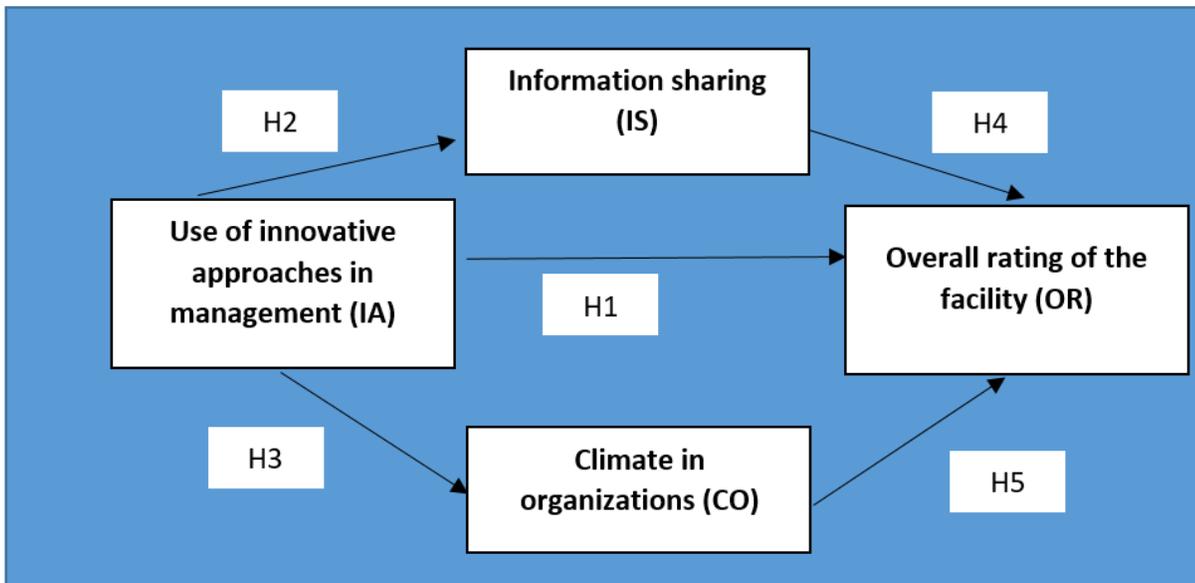


Figure 1. The mediation model and the 5 tested hypotheses

3. Material and methods

Sample and Data collection

Our sample consisted of 44 top managers of healthcare facilities in Slovakia. Hospitals, 11 teaching and 33 general hospitals (27 state and 17 private) were selected. The main reason is that these facilities are registered in the database of a INEKO Institute and published on its website as an official document on the performance of these facilities for the years 2015 to 2019 in the form of the overall rating of the facility, calculated below. Subsequently, we contacted the top management of these facilities through personal contact and explained our intention and research model, offering the provision of results and the possibility of comparison in the use of innovative management tools. In agreement with the representatives of the facilities, we sent them a questionnaire by e-mail. The questionnaire was sent at the end of September 2020. By the end of October, all 44 responses were returned. The return was 100% due to the fact that we contacted only pre-agreed contacts, as the output information on organizational performance was available only from the selected hospitals. The questionnaire contained identification data and the core of the questionnaire consisted of scaled questions in three areas - innovative approaches and satisfaction with the state of their application in the facility, information sharing with disagreement / disagreement with the above statements and climate in the organization.

The structure of the sample of respondents is shown in Table 1.

Table 1. Characteristics of the examined sample of respondents

		Frequency	Percent
Organization	Faculty hospital	11	25
	General hospital	33	75
	<i>Total</i>	44	100
Legal form	Public limited liability company	15	34,1
	Non-profit organization	8	18,2
	Contributory organization	17	38,6
	Private limited company	3	6,8
	Association (union)	1	2,3
<i>Total</i>	44	100	
Position	General director	7	15,9
	Hospital director	37	84,1
	<i>Total</i>	44	100
Education (MUDr., other Universities)	Ing.	16	36,4
	Ing. Et Ing.	1	2,3
	Ing. Mgr.	1	2,3
	Mgr.	2	4,5
	MUDr.	22	50,0
	MUDr. Mgr.	1	2,3
	PhDr.	1	2,3
<i>Total</i>	44	100	
Completed specialized management study (MPH, MBA...)	Yes	19	43,2
	No	25	56,8
	<i>Total</i>	44	100
Gender (male, female)	male	35	79,5
	female	9	20,5
	<i>Total</i>	44	100

Data Analysis

All data were analyzed using the SPSS 24.0 software package. Cronbach's α coefficient was used to assess the internal consistency reliability of scales. The Baron and Kenny mediator model was used to test the correlations and the Sobel test to test the mediator effect. A series of regression analysis were used to identify the proposed hypotheses. The control variables were the legal form of the facility and age, gender, and completed the managerial study of the director of the organization. ANOVA was used to analyze the multiple dependence. We worked at a significance level of 5%. Multiple regression of innovation items was also used for the overall evaluation of hospitals.

Measures

IA are an independent, explanatory variable. This variable is realized (is operationalized) as a score based on the answers of managers to the questions of satisfaction with the state of application of innovative management tools in the organization. In total, the independent variable IA contains 11 items (see Appendix 1), which are scaled using 6-point Likert-type scales (6 - absolutely satisfied, 5 - satisfied, 4 - rather satisfied, 3 - rather dissatisfied, 2 - dissatisfied, 1 - significantly dissatisfied). After reliability analysis, the Cronbach's α of the IA was 0.772 (11 items).

The second, dependent variable, representing the consequence, is the indicator of the OR of a medical facility, published on the website of the Institute for Economic and Social Reforms of the Slovak Republic (INEKO). Since 2015, this organization has been evaluating health care facilities on the basis of a developed methodology, accepting their availability and relevance, wide scope and stability in the selection of indicators (data were monitored for several years to minimize the impact of random one-time fluctuations, most indicators were monitored 4 -season). INEKO takes over data from health insurance companies (in Slovakia these are General Health Insurance Company, Dôvera and Union Insurance Companies) health facilities, the Ministry of Health of the Slovak Republic, the Ministry of Finance of the Slovak Republic, self-governing regions, the Health Care Supervision Office, the National Health Information Center, the Emergency Medical Service Operations Center and Transparency International Slovakia. The evaluation was carried out for state university and teaching hospitals - 11 facilities (note: children's teaching hospitals were not assessed) and general hospitals - 53 facilities (of which 33 hospitals passed the qualification criteria).

Hospitals were assessed on the basis of the following indicators: 1. Quality of health care provided (sub-indicators: reoperation, total rehospitalization within 30 days, mortality after operations, mortality from acute cerebrovascular accident, mortality after femoral fracture (65+ years), mortality in the intensive care unit, mortality in the inpatient department after translation from the intensive care unit, waiting time of the patient on the emergency admission brought by the ambulance, fines from the Health Care Supervision Office; (value 40%). The indicators result from the statutory quality indicators in the field of health care outcomes. Indicators and their definition are determined by the Ministry of Health of the Slovak Republic. Health insurance companies are obliged to monitor these indicators. They draw on the data provided by the healthcare provided to them by individual providers. 2. Experience (sub-indicators: Index of the number of so-called EBHR procedures (procedures used in stratification; value 10%). 3. Difficulty of diagnoses (sub-indicators: Case Mix Index (CMI) of the hospital, expressing the average economic and medical demands of patients hospitalized in the hospital for a certain period of time, in our case per year; value 10%). 4. Patient satisfaction (sub-indicators: overall patient satisfaction and patient complaints; value 18%). It is a summary indicator - the average of 12 statutory quality indicators in the field of perception of healthcare provision by hospitalized patients. The indicator is formed as a synthetic index of the subjective evaluation of the provider from the point of view of patients covering the evaluation of their satisfaction with care, behavior and information provided by health care staff, evaluation of

accommodation quality, cleaning of wards and diet and evaluation of satisfaction with provided care and subjective perception of treatment success. Complaints are measured as the total number of complaints per hospital in relation to 1000 hospitalized patients, which were addressed to the Health Care Supervision Office and where the Office terminated the supervision of the provider concerned. 5. Economy (sub-indicators: ability to generate own funds and overdue debt and its year-on-year change; valued 12%) and 6. transparency (sub-indicators: transparency index representing a summary assessment of individual facilities based on the quality of patient information and other public and economic information; value 10%). The resulting hospital rating is calculated as a weighted average of the points achieved for the above indicators. In total, the device could get a maximum of 100 points, a minimum of 0 points, while the more points, the better the rating and ranking.

Information sharing (IS) is variable, that is operationalized as a score based on managers' answers on the items listed in Table 2. The scale for IS was adopted from the study of Ketokivi and Castañer (Ketokivi & Castañer, 2004), who measured the sharing of general information and communication of organizational priorities with employees. In total, the intermediate variable IS contains 5 items (see Appendix 1), which are scaled using 6-point Likert-type scales (6 - strongly agree, 5 - agree, 4 - rather agree, 3 - rather disagree, 2 - disagree, 1 - strongly I do not agree). After reliability analysis, the Cronbach's alpha of the IS was 0.969 (5 items).

The second mediator is the CO variable. It is operationalized as a score based on managers' statements for the items listed in Table 1. The scale for CO was adopted from a literature search on the issue of organizational climate, while the authors measured in different ways the atmosphere that prevails in the organization and which is manifested by a collective consensus on certain aspects of the organization. In total, the variable CO contains 8 items (see Appendix 1), which are scaled using 6-point Likert-type scales (6 - strongly agree, 5 - agree, 4 - rather agree, 3 - rather disagree, 2 - disagree, 1 - strongly I do not agree). After reliability analysis, the Cronbach's alpha of the CO was 0.980 (8 items). The internal consistency of the variables used is very good.

4. Results

Examining the items of individual variables, we found that within the innovative management approaches, the highest satisfaction with their application in hospitals was presented in tools of comprehensive and systematic change management (mean = 3.66, StD = 1.055) and innovative quality management tools (mean = 3.43, StD = 1.108). Above 3 within the selected scale from 1 to 6, approaches in organization (mean = 3.27, StD = 1.283), in human resources management (mean = 3.11, StD = 1.166) and in the process approach in management (mean = 3.05, StD = 0.861) were declared. Other innovative approaches gained very low average values, ranging from mean = 2.00 (IA in strategic management) to mean = 2.84 (IA in human resources management). It is clear from the results that IA in management are used to a very low extent by hospitals, and at the same time a higher standard deviation was found in innovative approaches with a higher average, which indicates high differences in application.

As mediators that could amplify the effect of IA in management on the OR of facilities, we have chosen IS and the CO. Within the variable IS, we found out the agreement / disagreement with the submitted statements. The answers ranged from mean = 3.52 (regular information on the plans of their departments) to mean = 3.82 (regular information on the requirements for the performance of employees), but the standard deviations are again high and indicate differences between individual facilities.

For the mediating variable CO, we asked about the importance of the selected tool on a scale from 1 to 6 in a particular organization in managing people. The average values are higher than for the IS variable and range from mean = 3.84 (teamwork) to mean = 4.05 (employee behavior). High standard deviations were also found in this case.

We determined the connections between the individual variables by a correlation matrix, in which variables are also included in the matrix.

Descriptive statistics and the correlation matrix itself are shown in Table 2.

Table 2. Descriptive statistics and correlation matrix

Variable	Mean	StD	N	OR	IA	IS	CO	SMS	G	LF
OR	52,14	6,70	44	-						
IA	2,92	0,51	44	0,787**	-					
IS	3,65	1,22	44	0,820**	0,638**	-				
CO	3,92	1,25	44	0,083	0,113	0,061	-			
SMS	1,57	0,50	44	-0,248**	-0,234**	-0,090	-0,191	-		
G	1,20	0,41	44	-0,052	-0,124	-0,246	-0,107	-0,127	-	
LF	1,34	0,48	44	0,017	0,061**	0,122**	0,192**	0,240	0,230	-

Notes: OR = overall rating of the facility, IA = innovative approaches, IS = information sharing, CO = climate in the organization, SMS = completed specialized management study (1 = yes, 2 = no), G = gender (1 = male, 2 = female), LF = legal form (1 = non-profit organization, contributory organization, association, 2 = joint stock company) ** $p > .0.5$

It is clear from the correlation matrix that there are significantly positive correlations between the OR of facilities and IA to management as well as IS. A positive relationship between the OR and the CO has been demonstrated, but is not statistically significant. The existing relationships between the examined variables indicate the use of mediator model. At the same time, the examination of the context revealed to us that there is a negative connection between the OR and the completion of the managerial specialization study, as well as between the implementation of IA and the completion of the managerial specialization study. Negative associations were also found between the other two variables, namely the IS and CO and the completion of a managerial specialization study. However, these were statistically significant. Those directors who have completed specialized studies in the field of management also try to share information in the organization and also to support its climate. No statistically significant correlations were found with gender in the examined variables. However, it turned out that more of them are used by men. In connection with the legal form, we divided the hospitals into 2 groups. The first consisted of non-profit, contributory organizations and associations run by the state, and the second group consisted of hospitals belonging to the company „World of Health“. This company operates a regional network of 17 hospitals in Slovakia, which are among the leaders in innovation, digitalization and emphasis on the quality and safety of healthcare provided. At the same time, they emphasize financially sustainable and modern healthcare. The „World of health“ is part of the multinational holding Penta Hospitals International, which operates dozens of hospitals and outpatient fclinics in Central Europe. The correlation matrix pointed to a positive relationship between this type of hospital and the overall rating (not statistically significant), but a statistically significant correlation was found in applying IA to management, IS and CO in hospitals belonging to the World of Health as a joint stock company. Even the specialized management study was in a positive connection with this form of providing health services, although not statistically significant.

In mediation, we used the main hypothesis: **The dependence between the use of IA in management of healthcare facilities and the OR of the facility is mediated by the CO and IS.**

The distribution of variance for the overall dependence in the baseline model showed that no control variable was significant (p-value < 0.5), therefore were not included in further regressions.

The multiple regression is shown in Table 3.

Table 3. Regression results for main effects and mediation analysis

Variable	Model 0		Model 1		Model 2		Model 3		Model 4	
Dependent	OR		OR		IS		CO		OR	
	Coefficient	(SE)								
Constant	21,50	6,02	22,10	3,69	-0,77	0,84	3,12	1,11	24,38	3,09
Main effects										
IA	10,31**	1,31	10,28**	1,25					5,81**	1,24
IS					1,51**	0,28			2,96**	0,52
CO							0,27	0,37	0,00	0,39
Controls										
SMS	-0,85	1,35								
G	0,97	1,70								
LF	3,20	2,33								
R2.adj	0,82		0,79		0,64		0,11		0,89	

Notes: OR = overall rating of the facility, IA = innovative approaches, IS = information sharing, CO = climate in the organization, SMS = completed specialized management study (1 = yes, 2 = no), G = gender (1 = male, 2 = female), LF = legal form (1 = non-profit organization, contributory organization, association, 2 = joint stock company) ** $p > .05$

The total dependence between the dependent and independent variables in the initial model is significant (coef. = 10.31, Sig. = 0.000). We found out, that is a significant relation between the mediation variable IS and IA (IS:model 2, coef.=1.51, Sig.= 0,000). Mediator “CO” was not significant (CO: model 3, coef.=0.27, Sig.>0.05). The relations between mediators and the dependent variable are significant only in the case of IS (model 4, ZI - coef. = 2.96, Sig. = 0.000), CO (coef.=0.00, Sig.>0.000).

In addition to the two indirect (mediated) paths, there is also a path for a direct relationship and this path is significant. IA versus OR (coef. =5.81, Sig.=0.000).

Total indirect effect $AxB= 4.470$ (SE=0.980, $z=4.561$, Sig.=0.000) is significant and the dependence is positive. Indirect effects provided by individual mediators are significant only for variable IS (for IS is SE= 0.970, $AixBi= 4.470$, $zi=4.608$, Sig.=0.000), non-significant for variable CO (SE=0.150, $AixBi= 0.000$, $zi=0.002$, Sig.=0.999). Somehow direct effect C (effect IA on OR) is also significant, the presentation about non-complete mediation was approved.

The value of effects of the components of the used model is presented in the table 4.

Table 4. The value of effects of the components of the used model

Effect	Coefficient	%
Total	10,280	100%
Direct	5,810	57%
Indirect	4,470	43%
Indirect through M1:	4,470	
Indirect through M2:	0,000	

From the table we see that the direct effect is relatively higher (57%) than the indirect effect (43 This means that the direct interaction of two variables – IA in management of organizations and their overall evaluation - is more significant than the interaction mediated between these variables with the IS having the greatest impact in indirect action - renting the whole indirect effect.

Due to the fact that the examined mediation found a significant direct effect compared to the indirect effect, we were interested in which innovative approaches contribute most to the positive relationship between the overall rating of organizations and the implementation of innovative approaches. We used multiple regression of management innovation items for the overall evaluation of hospitals. The results are shown in Table 5.

Table 5. Multiple regression items IA in management

	1	2	3	4	5	6	7	8	9	10	11
coefficient	4,702	2,793	0,688	0,304	0,019	0,372	-0,503	0,132	0,218	0,011	0,794
calculations											
SE	0,818	0,741	0,458	0,396	0,436	0,370	0,516	0,470	0,617	0,363	0,660
t	5,748	3,767	1,503	0,769	0,044	1,007	-0,975	0,281	0,354	0,029	1,202
p	0,000	0,001	0,143	0,448	0,965	0,321	0,337	0,780	0,726	0,977	0,238
crit.adj.	0,005	0,005	0,005	0,005	0,005	0,005	0,005	0,005	0,005	0,005	0,005

Notes: 1= Innovative tools in strategic management, 2 = Innovative tools in planning, 3 = Innovative tools in organization, 4 = Innovative tools in HR, 5 = Innovative tools in people management, 6 = Innovative tools in control, 7 = comprehensive and systemic change management, 8 = quality management through models (EFQM, CAF, TQM...), 9 = process approach in management, 10 = risk management, 11 = diversity management, SE = standard error of the coefficient, t = test statistics t, p = p value (p <0,05), crit.adj. = adjusted significance level corrected for multiple comparisons.

The dependence with variable OR is most influed by tools 1 (innovative tools in strategic management) and tools 2 (innovative tools in planning), for which the highest positive coefficient was found (statistical significance p <0.05). The coefficient represents the increase in the valuation at the unit change of the item. For other innovative approaches, the coefficients were not high (they were below 1), nor were they statistically significant and even for an innovative tool 7 (comprehensive and systemic change management) the coefficient was negative, which indicates a decrease in the valuation of the unit change of the item.

5. Discussion

Healthcare organizations around the world face challenges related to the rapid shifts of the 21st century in every area. A persistent knowledge gap is the solution to high-quality healthcare and limited resources faced by all developed countries with regard to health care financing systems. Against this background, the question of health leaders at every level of management and the examination of the mechanisms by which they can achieve high-quality organizational performance comes to the fore. The question of examining these mechanisms is very complex and ambiguous. It reflects many internal and especially external factors. In any case, it can be an enrichment and benefit in a broad scientific field dealing with improving the quality of advanced health services.

Given the conditions under which we worked in the research, we excluded the examination of endogeneity and we based research on the analysis of the relationship between individual variables. A simple correlation analysis is not a tool for a deeper understanding of the interacting mechanisms, so we used mediation as the main statistical tool. Through mediation, we found out that the effect of IA in management of organizations on their OR through measured IS and CO has been statistically confirmed. Based on the above, we confirm the main hypothesis.

We have therefore found that both the indirect and direct effects are significant. The indirect effect does not reach more than 80% of the total effect, it is therefore an incomplete mediation. Only a part of the effect (43%) is mediated by mediation variables, its lower part. The rest, which is bigger part is transmitted directly (57%). In any case, this is an important finding, namely that the OR of a facility can be influenced by IA of management and enhance its effect through IS. Partial hypotheses H2 and H4 were confirmed. The CO, which is presented by some studies as a significant factor influencing the performance of the organization (Ali et al., 2018; Savage et al., 2020; Shipton et al., 2008) in our study did not prove to be significant. It does not participate in the mediating role of the association between IA in management and OR and its impact is not significant. The direct connection between climate and innovative approaches or the overall rating has not even been demonstrated, so the partial hypotheses H3 and H5 have not been confirmed. IA in management need to be implemented differently in the environment of Slovak hospitals. The main tool is IS in hospitals. Innovations in management represent changes that are necessary to communicate, disseminate, share. Therefore, informing employees about important changes, overall policies and goals, how to evaluate the performance of the organization and the results achieved, as well as the requirements related to the performance of employees themselves are essential for providing high quality services, for their high professional level, but also for the purpose of greater patient satisfaction, better economy and transparency. Our findings are in line with the findings of many studies on the positive impact of IS on organizational performance while implementing innovation and management changes (Aragón-Correa et al., 2013; Bodenheimer & Sinsky, 2014; Roohi et al., 2020).

At the same time, we found that of the IA in management, innovations in strategic management (4,702) and planning (2,793) contribute the most to the OR of hospitals, where the coefficient of increase of evaluation in the unit change of both items was the highest. Our findings are consistent with the findings of the authors Sunol et al. (Suñol et al., 2009), who demonstrated a positive impact of quality strategies on hospital outputs. A very low increase in the overall rating was found in the item - unit change of the quality management (0,132). Although the coefficient is positive, which indicates a certain positive impact, it is very low compared to the findings of other studies, which showed a strong impact of using EFQM models or other best practices of Total Quality Management on organizational performance, even in the longer term (Johannesen et al., 2020; Nabitiz et al., 2006; Talib et al., 2011; van Schoten et al., 2016). On the contrary, the negative coefficient has been demonstrated in the comprehensive and systematic management of change (-0.503), which is often underestimated in organizations not only in the health sector but also in other areas. The reason is also given by Campbell et al. (Campbell, 2020) in his study, ignoring one or both important aspects - situational or psychological, which causes the implementation of change without any results.

Our study showed that IA in management as well as IS and climate support in organizations are more significantly implemented in hospitals - joint stock companies, belonging to the company “The World of Health”, which strives for efficient and effective implementation of management tools in its network of hospitals. Significant positive correlations with the OR of hospitals are currently demonstrated mainly in the level of hard factors, but also in the level of soft management factors such as human leadership or human resources management, certain elements have been noted that gradually penetrate the management of these hospitals with a positive impact on their overall performance. Sibbald et al. (Sibbald et al., 2020), Brown et al. (Brown et al., 2016), Cunningham et al. (Cunningham et al., 2012) point to the growing importance of networks in health care in the context of improving the performance of all stakeholders.

5. Conclusions, practice implication and limitations

We see the practical implications of our research on several levels. The first is the fact that the performance of medical facilities is not a simple and one-dimensional concept. Many aspects need to be taken into account, which vary from one stakeholder group to another and cover different areas, including the quality of services, their level

of expertise, patient satisfaction, cost-effectiveness and transparency. All aspects must be considered at the same time.

The second level of implication is the knowledge of the mechanisms by which hospital management influences their performance, taking into account the relentless pressures of the 21st century on health care systems around the world. Building, but especially maintaining, high-quality health services that reflect the demands of an advanced technology society is a challenge for all developed countries, and at the same time the debate on the new role of health leaders and the need for their development and education comes to the fore. Although we do not describe causality, our findings are in line with the theoretical considerations outlined in the introductory part of the paper.

Within this level, the following implications are important. (1) Recognizing that, when it comes to moving forward, healthcare management necessarily requires new innovative approaches that will enable today's healthcare managers to cope with extremely challenging situations related to the constant changes in the social environment and to achieve excellent performance within them. These approaches will allow them to orientate themselves in the flood of information that managers encounter on a daily basis and support them in making strategic decisions. It is based on a clear and concise vision, knowledge of the direction of your organization and knowledge of answers to important strategic questions. (2) Knowing the vision and direction, as well as developing a strategic orientation through innovative tools, is not enough. It is important to share information, acquaint employees, communicate, present, spread outwards and inside the organization. Even in traditional bureaucratic structures in healthcare, there is a shift from management toward leadership, which not only manages, but above all inspires its followers.

The third level of our research has an impact on the managerial role of healthcare professionals, which is constantly discussed, and it turns out that its importance will constantly grow and influence the positive performance of hospitals. Related to this is the support of managerial education of leading healthcare professionals in accordance with new managerial trends and the needs of modern hospitals in the new technological era. Managers, regardless of completed university education (doctor or other), but with completed specialization studies in management, implement management innovations to a greater extent, and these subsequently have a strong positive effect on the overall rating of facilities through information sharing in organizations. This means higher quality of services provided, evaluated by seven quality indicators, resulting from statutory quality indicators in the field of health care outcomes, higher experience in the implementation of services used in stratification, higher average economic and medical demands of patients hospitalized for certain time period, for patient satisfaction, hospital management and transparency, measured on the basis of the level of quality of information provided to patients and the general public and economic information.

The fourth level of implications is important in terms of demonstrating the importance of networks in health care and integrating and interdisciplinary tools that support coordination between service providers, improve their quality and other performance indicators through shared leadership, shared vision, transparent communication.

Our research has several limitations. The first is a sample of respondents. We are aware that due to the number of entities providing health care in Slovakia, the number of respondents is low. On the other hand, measuring the performance of medical facilities is not a simple and one-dimensional concept. It covers many aspects that are very difficult to report, as the information needed to calculate them comes from several stakeholders and relates to different areas of service provision. For this reason, we consider our sample to be sufficient and we consider the performance data to be highly valuable, as in such a summary and comprehensive expression in Slovakia they exist only in the facilities that make up our sample. Research can also be limited by subjective, sometimes overestimated views of managers on the implementation of innovations in their management, or on the items of the other two variables, namely information sharing and the climate in the organization. Given the conditions we

had in conducting the research, we excluded the study of endogeneity and we based the paper on an analysis of the relationships between individual variables. Research is the basis for further ongoing research, in which we can then work with time as a missing condition for endogeneity and delve deeper into the study of causal relationships. At the same time, when the ranking of hospitals is enriched with other subjects, the research can be carried out subsequently in these hospitals as well.

We see the scientific novelty of our study in the identification of mechanisms influencing the performance of hospitals in terms of innovations in management. The overall rating of a facility as a complex medical and economic indicator can be influenced by innovative approaches in management and enhance its effect through information sharing. Management innovations represent changes that need to be communicated, disseminated, and shared. Therefore, informing staff is essential for the provision of high quality services, for their high professional standards, but also for the purpose of higher patient satisfaction, better economy and transparency.

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Appendix 1 Content definition of the examined variables

Innovative approaches in management (satisfaction with the status of the application in the organization): 6 – absolutely satisfied, 1 – significantly dissatisfied

1. innovative tools in strategic management (BSC, BCG, scenarios,...)
2. innovative tools in planning (IT, business models,...)
3. innovative tools of organization (flexibility, agility, lean org.)
4. innovative tools in HRD (strategic partner, performance reward, talent management, employee contribution management,...)
5. innovative tools in people management (transformational, shared, compassionate, clinical, servant leadership)
6. innovative tools in control (BSC, analysis of deviations, self-control,...)
7. comprehensive and systematic change management (reengineering)
8. quality management through models (EFQM, CAF, TQM,...)
9. process approach in management (definition, analysis, process improvement)
10. risk management (Healthcare Failure Modes and Effects Analysis, Probability Risk Assessment,...)
11. diversity management (according to age, gender, ... , but also abilities, skills, thinking,...)

Information sharing

(6 – completely agree, 1 – strongly disagree)

1. Managers shall keep employees regularly informed of significant changes.
2. Managers shall regularly inform employees of overall policies and objectives.
3. Managers regularly inform employees about the method of evaluating the company’s performance and about the achieved results.
4. Managers shall regularly inform employees of the departments plans.
5. Managers regularly inform employees about the requirements related to the performance of their work.

Climate in the organization

(6 – absolutely important, 1 – significantly unimportant)

1. Informal communication
2. Opportunities for innovation
3. Employee involvement
4. Common Values
5. Employee behavior
6. Leadership style
7. Motivation
8. Team work

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