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Satisfaction of inpatients with health care facilities and medical services in Slovak Republic

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ABSTRACT

Evaluation of the healthcare facilities and inpatients satisfaction with healthcare services is a decisive point in the healthcare enhancement process. The aim of the study is to map the overall inpatients satisfaction with provided healthcare by healthcare facilities and its determinants in Slovak republic by using data from ranking of healthcare facilities published by Institute for Economic and Social Reforms (INEKO, 2021). Visual descriptive analysis reveals that there exist relatively large regional differences among inpatients satisfaction. Data indicates that there is no significant relationship between inpatient satisfaction and the number of inpatients per doctor; that there exists a negative nexus between complexity of provided healthcare and the overall inpatient satisfaction; and that positive relationship between the complexity and severity of treated diagnosis and the overall inpatient satisfaction can be observed. Regression analysis results indicate that inpatient satisfaction is positively linked to quality of the provided healthcare, overall rating of the hospital and to university hospitals; and negatively affected by operated inpatients to number of nurses ratio, reoperation, total rehospitalization within 30 days and to number of hospitalized inpatients.

1. Introduction

The patient satisfaction is an important measure of the healthcare quality, as it provides information on a level, which the patient expectations are met by the healthcare services to. Many research studies declare a wide range of the factors that either directly or indirectly affect the patient satisfaction. From a microeconomic point of view, the patient satisfaction is linked to the other indicators such as employee satisfaction, patient loyalty, quality of service provided, and so forth. From a macroeconomic point of view, the patient satisfaction is directly linked to the effectiveness of the offered healthcare service, the primary impact of which is reflected in financial savings (Megyesiova & Lieskovska, 2018). The effectiveness of the healthcare system

has been a dominant topic in the recent decades and it is related to the processes of the demographic aging and the sustainability of the health systems (Sopko & Kočišová, 2019).

The rapid technological developments, increasing life expectancy as well as innovations in treatment and the diagnostic processes have caused the population in the developed countries to live longer and longer, but the age, which serious human diseases begin to appear themselves is steadily declining at. Mainly the chronic noncommunicable diseases belong here that are also a priority for the various international institutions. In addition to mapping them, the aim of the international institutions is also to examine the differences in health not only between the countries but also within the countries, among the regions or the otherwise geographically defined territories. The regional health disparities are also related to the availability of healthcare, both geographically and economically (Pacáková & Kopecká, 2018; Bem et al., 2019). The insufficient access to healthcare service results in an underestimation of the primary symptoms of the incipient diseases, the treatment of which would be less process intensive and economically less expensive than during the advanced stages of the disease. The access to healthcare generally is often analysed in a relation to the quality of the healthcare services provided, as it is proven that in the denser populated areas, that are also economically more advanced, there is better access to highly specialised healthcare as well as the claimed higher quality of the healthcare services (Briestenský & Ključnikov, 2019). The patients evaluate this primarily from the point of view of the healthcare equipment, the environment of the outpatient department, the interpersonal relationships and the other factors.

The patient satisfaction is a very demanding concept that is created and evaluated by many subjects of the healthcare system. Its development is greatly complicated by the limited data, which is often obtained in the individual countries through the initiation of the national institutions, the research teams, or by the healthcare providers themselves. For this reason, the compatibility of the individual databases and complicated national as well as international comparison are problematic too. Despite this fact, the creation of the national databases is very important both in the conceptual field and in the evaluation of the individual healthcare providers for the creation of the national and regional strategic health system plans as well as the development of the adequate policies to improve the quality and efficiency of the healthcare service (Korshenkov & Ignatyev, 2020). Just right in the process of increasing the quality and efficiency of the healthcare service for the individual healthcare providers that measuring and evaluating the patient satisfaction bears considerable importance. Many available concepts will also need to be modified depending on the procedural changes in their use caused by the serious changes in the health systems of the countries – for instance, the current coronavirus disease 2019 pandemic (Besenyő & Kármán, 2020).

These consistent facts create a motivation to carry out the analytical research aimed at an investigation of the influencing dimensions of the patient satisfaction related to the healthcare service. The selection of the variables is performed according to the available data in this field. They can be understood as the groups according to their interrelationships. The analysis outcome provides a valuable platform for the policymakers and the strategic planners as well as for the development of the national

and international benchmarking indicators. They are also necessary for the development and the improvement of the methodological processes that would facilitate the measurement and the evaluation of the quality and effectiveness of the health system as well as the development of the measurement system, which the patient dimension is cardinally linked to the financial, procedural, and staffing dimensions in.

2. Literature review

Many international research studies examine the factors and the processes for measuring the patient satisfaction in the healthcare facilities as well as its impacts. There is largely presented the form of the implications for policymaking as well as the recommendations for the health system actors in the individual countries in a field of the impacts of measuring and assessing satisfaction. Several authors agree that the concepts of its measurement and evaluation are insufficient and that it is necessary to create an appropriate reference framework in order to ensure sufficient compatibility of the database as well as the possibility of a national and international comparison. The issue is not only in the methodological framework, but also in the definition of the patient satisfaction that can be linked to the psychological or procedural aspects, as well as it can be influenced by the socioeconomic characteristics of the respondent. Despite these facts, the research studies provide valuable information for the formulation of a discussion platform in this area, along with for the implementation of the follow-up research and the share of knowledge in the international research environment (Westaway et al., 2003; Pilav & Jatić, 2017; Hayran & Özer, 2018).

Naidu (2009) examines the factors influencing the patient satisfaction and healthcare quality in order to create a comprehensive conceptual model for understanding and measuring variables affecting the health satisfaction quality based on the patient satisfaction. The methodological framework of the study is created by the peer-reviewed international studies with the subject matter. The study concludes that the patient satisfaction is a multidimensional healthcare construct affected by many variables. It points to the trajectory meant as the effect of the patient satisfaction on their loyalty. A multidisciplinary approach is also important to quantify the impact of the healthcare quality on the patient satisfaction. The study offers several implications for the healthcare regulators and combines numerous research findings.

Ferrand et al. (2016) point to a change in the approach to assessing the quality of healthcare through the patient satisfaction. This is also influenced by the changes in the funding systems that also create the differences in the supply of the healthcare service. The authors state that the patient satisfaction is a very complex matter and therefore, their study provides a critical overview of the papers focused on it. The authors also evaluate the shortcomings of the research studies and formulate the recommendations within it, which the dimensions should be given the utmost attention when examining the patient satisfaction on.

Gardner et al. (2018) analyse the quality management system that is comprehensive and very demanding. In their study, the authors point out the mutual interactions of the quality subsystems and the importance of the decisions in the individual process phases as changes in one part of the quality management system affect

another part of the system. The results of the study demonstrate that the existing work in the healthcare system most often focuses on linking quality with the strategy, the operational processes, as well as with the customer relationships. A relation between quality and source with the logistics processes is analysed at a much reduced level.

Chui et al. (2019) also takes aim of the importance of an investigation and monitoring the patient behaviour based on the big data and the internet of things. The authors conducted the qualitative analysis of the behavioural studies, an identification of the cardiovascular diseases as well as the fall detection. They consider trust, security and interoperability, and privacy the most important aspects of improving the quality of human life.

Gill and White (2009) also evaluate the available research studies on the perceived quality of the healthcare services. They focus on the meta-analyses, which they critically analyse the theory and application in, with the aim of revealing the methodological shortcomings associated with the concept as well as confronting the perceived theory of service quality. In their conclusion, the authors point out the insufficient development of the concepts for the patient satisfaction assessment as an indicator of the quality of healthcare.

Xesfingi and Vozikis (2016) concentrate on the patient satisfaction evaluation too. Their research ambition is to assess the relationship between the patient satisfaction in the health system with a set of the socioeconomic indicators and the healthcare delivery indicators. The authors perform the empirical analysis based on the data from the 31 countries related to the years 2007, 2008, 2009, and 2012. The results of the analyses show a strong positive association between the patient satisfaction and the public health expenditures, the number of physicians and nurses, and the age of the patient. The older the patient, the more satisfied is with the healthcare system of the country.

Marcinowicz et al. (2009) estimate the patient satisfaction, as well as many other authors, to be a complex and difficultly measurable process, which, in addition to the quantitative and qualitative methods, the specific concepts are applied in. Therefore, according to the authors, it is important to identify the specific dimensions of the healthcare service, which the factors determining the patient satisfaction or the dissatisfaction would be defined within. The qualitative research is conducted through the in-depth interviews with the patients who have family physicians. The results demonstrate that the patients point mainly to the problems related to the interpersonal relationships with their physician. The second most important aspect of their satisfaction is created by the conditions, which the healthcare is provided under. The least significant factors influencing the patient satisfaction are the physician competencies and the personal qualities. The results of the study clearly demonstrate the need to improve the interactions between patient and physician in order to ensure a higher quality of the healthcare service and also the higher patient satisfaction based on it.

Janicijevic et al. (2013) confirm the causality between the patient satisfaction and the other healthcare provision participants. They try to assess the extent, which the satisfaction of the healthcare personnel also affects the patient satisfaction to. In addition, they examine which aspects of the healthcare staff satisfaction affect the quality

of healthcare services and the patient satisfaction too. The authors apply the questionnaire survey with the research sample consisting of the 18,642 healthcare personnel and the 9,283 patients from the 50 secondary healthcare facilities in the Republic of Serbia. The results indicate a low correlation factor between the healthcare personnel satisfaction and the patient satisfaction. Therefore, it is important to further investigate these interactions and the processes related to healthcare provision. The time that healthcare staff have to complete tasks will also play an important role, and according to the authors, this attribute has the greatest impact on the patient satisfaction. The authors appeal to the importance of understanding the importance of the certain components and the processes of the healthcare satisfaction that will also have an impact on the creation of the policies and the strategies to increase the quality of healthcare service.

Aiken et al. (2018) defines the evaluation of the patient satisfaction on the selected attributes, which the patient confidence in physicians and nurses, the level of the healthcare facility personnel, and the healthcare facility work environment belong among. The authors process the cross-sectional survey of the 66,348 healthcare facility patients and the 2,963 inpatient nurses. The results of their research point to the fact that the perception of the quality of healthcare by the patients in the healthcare facility is strongly associated with the absence of professional nursing that is also related to the insufficient staffing of the professional nurses and the poorer working environment in the healthcare facilities. Improving personnel situation also possess an impact on the increasing patient satisfaction.

Ng and Luk (2019) demonstrate the need to examine the definition of the patient satisfaction. The authors offer the conceptual analysis in order to examine the attributes of the patient satisfaction concept in a broader definition framework. The results of their analysis show the necessity for a deeper examination of the perspective of the patients with the intention of revealing all the possibilities of increasing their satisfaction. In addition to the standard attributes of the patient satisfaction, the authors mention the requirement to examine the differences in a perception of the patient expectations, the differences in a perception of the patient satisfaction in relation to the demographic factors, patient personality, as well as market competition.

The study by Fatima et al. (2018) focuses on the evaluation of the quality of the healthcare service and hence, it analyses the relative importance of measuring quality in the processes of the predicting patient satisfaction and loyalty too. The authors define the patient satisfaction as a mediating role between the quality of healthcare service in the hospitals and the patient loyalty. The research applies the questionnaire survey from the six private hospitals in the Islamic Republic of Pakistan with the research sample consisting of the 611 patients. The findings show that the private healthcare providers work to provide the patients with better service. The results confirm that the better quality of the healthcare provided has a significant impact on the patient satisfaction and the loyalty.

Ramaswamy et al. (2020) also highlight the importance of the telemedicine in assessing the patient satisfaction. During the coronavirus disease 2019 pandemic, it is necessary to quickly change the form of the personal consultations with the specialist for the online consultation. The analysis outcome shows a rapid increase in the use

of the online consultation, as well as high patient satisfaction related to it. However, in order to comprehensively assess the significance of the change of the consultation from a physical form to an online form even in non-pandemic time, it is necessary to carry out the further research in this field.

Ramli (2019) applied the structural equation modelling to analyse the interrelationships between the variables that influence the patient satisfaction. The research sample consists of the 225 patients evenly distributed in the three hospitals. The outcome demonstrates that the system of the healthcare service provision consisting of the physical support and the contact personnel has a significant positive impact on the patient satisfaction.

Batbaatar et al. (2015) state that the concept of the patient satisfaction is a poorly developed concept according to a lot of evidence. It is widely understood because of its applicability and usability for the healthcare service. For this reason, the authors explore the theoretical framework further. They have assessed that most theories and formulations of the patient satisfaction are based on the marketing theories and they are defined as a measure of meeting the patient expectations of the healthcare provision. The results of the analysis show that the relationship between the patient expectations and the patient satisfaction is unclear and such a concept needs to be scrutinised in more detail. The study appeals to the greater importance of evaluation of the patient satisfaction from a patient perspective than from a marketing perspective.

Lobo Prabhu et al. (2018) examine the patient satisfaction in relation to the health outcomes associated with the surgical procedures. The aim of the study is to quantify the relationship between the patient satisfaction and the short-term treatment outcomes of those patients who underwent the surgical procedures. The carried out analysis is based on the 757 survey respondents. The results show that the patient having no complications and thirty-day readmission are more satisfied. Also, the planned surgical procedures are associated with a higher probability of the patient satisfaction. Thus, it becomes an important indicator in evaluation of the quality of health care.

Batbaatar et al. (2017) examine the determinants of the patient satisfaction through the analysis of the studies from the international publication databases for the period from the year 1980 to the year 2014. The authors point to the problematic unification of the groups of the determinants of the patient satisfaction due to the absence of a generally accepted formulation of such a system and a way of its measurement. Hence, the results suggest the need to design a robust system for measuring the patient satisfaction.

From the available international research studies, the two scientific and analytical lines for an examination of the patient satisfaction are clear. In the first group, the research studies focus on the patient satisfaction as a quality indicator or as a part of the measurement and evaluation system or at a less significant level, on the national comparison and the ranking of the healthcare providers. In the second group, the research studies focus on the evaluation of the patient satisfaction within the defined process of the healthcare provision – for instance, the patient satisfaction after a given surgical or other medical procedure or operation, diagnostic or therapeutic examination, and so forth. These studies are usually related to the specific diagnoses or the

diagnoses groups, as well as to a specific healthcare facility department. The main disadvantage of these studies is a unification issue of the research outcome and subsequently, an issue with the standardisation of the specific processes, as they may be different depending on the technology applied, the skills of the physician, and so forth. On the other hand, the results of such studies are valuable for the healthcare facility managers and its department managers who attempt to improve the quality of the treatment and diagnostic processes within their department and thus, to support partially the improvement of the quality and the efficiency of the healthcare facility as a whole altogether with its reputation. These consistent facts justify the importance of the carried out research aimed at an assessment of the patient satisfaction, as it is also an important motivator for the healthcare personnel and for improving the working climate in the healthcare facility. It also creates a support mechanism for setting up the enhancement processes in the quality of the healthcare service between the departments.

3. Data and methodology

We use data of Institute for Economic and Social Reforms, a non-governmental non-profit organization that monitors economic and social reforms in Slovak republic. Institute for Economic and Social Reforms surveys outputs and quality of provided healthcare in Slovak republic and propose the ranking of hospitals for several years. Ranking use several datasets that are issued by healthcare authorities and stakeholdrs is Slovak republic. Institute for Economic and Social Reforms retrieves data from health insurance companies, Ministry of Health of the Slovak Republic, Ministry of Finance of the Slovak Republic, self-governing regions, medical facilities, Health Care Surveillance Authority, National Health Information Center, Operational Centre of Medical Rescue Service of the Slovak Republic and Transparency International Slovakia (INEKO, 2021). The methodology of ranking of the quality of hospitals is governed by three principles: availability and relevance of information, universality and time stability of data. Ranking take into account all 11 university hospitals, and 33 out of 53 general hospitals in Slovak republic. To be included in the rated sample, hospital have to provide institutional health care in at least five of the following seven specializations, while the number of hospitalized or operatied inpatients is at least 100: internal medicine, surgery, pediatrics, neurology, gynecology and obstetrics department, neonatology and department of anaesthesiology and intensive care. Rating consists of 6 domains that are finally refleted into overall raking of healthcare quality, while university hospitals are rated seperatly and general hospitals likewise. The overall rating of healthcare facility consist of six categories of indicators, which are presented in the Table 1. For an analysis, we use data from 2018-2021 for all heathcare facilities that are included in the rating. All indicators are scaled on the scale 0 to 100, whilst the higher the value of the indicator, the better the hospital is the given domain.

Quality of provided health care concern selected indicators of health care outcomes. The indicators and their definition are determined by the Ministry of Health

Table 1. Ranking components.

	Category of indicators	Weight	Indicators
OVERALL RANKING	Quality of provided health care	40%	Reoperation
			Total rehospitalization within 30 days
			Postoperative mortality
			Mortality due to acute stroke
			Femur fracture mortality (65+ years)Intensive care unit mortality
			Inpatient mortality after transfer from intensive care unit
			Emergency waiting time
			Fines from the Health Care Surveillance Authority
	Experience	10%	Evidence-based hospital referrals
	Severity of inpatient diagnoses	10%	Case Mix Index
	Overall inpatient satisfaction	18%	Overall inpatient satisfaction inpatient complaints
	Economy	12%	Ability to generate own resources
			Overdue debt and its year on year change
	Transparency	18%	Transparency index

Source: own sourcing

of the Slovak Republic and health insurance companies are required to monitor these indicators.

Operating experience of doctors represents a summary indicator composed of various groups of procedures, which are a subset of 28 procedures defined by the Ministry of Health of the Slovak Republic. Severity of inpatient diagnoses, respectively. Case mix index variable expresses the average economic and medical demands of inpatients over a time. Case mix index expresses the ratio of the average cost per hospitalization of the relevant Diagnosis Related Groups. Cases are grouped with similar clinical characteristics and similar treatment costs, with respect to the average cost per average case. Overall inpatient satisfaction is the summary indicator composed of the 12 quality indicators in the domain of perception of healthcare provision by hospitalized patients. The indicator is formed as an aggregate index of the hospital evaluation from the patients' point of view covering the evaluation of their satisfaction with overall care, behaviour and information provided by medical staff, evaluation of accommodation quality, cleanness of the department, dietary satisfaction, evaluation of satisfaction with provided health care and subjective perception of treatment success. Economy indicator indicates the hospital's ability to create its own resources for the renewal and modernization of assets. Transparency index is an assessment of individual facilities based on the level of quality of information provided to patients and to public (INEKO, 2021).

The aim of the study is to map the overall inpatients safisfaction with healthcare provided by healthcare facilities. Analysis is divided into two parts. First part of the analysis use descriptive analysis to describe the inpatients satisfaction due to selected characteristics of hospitals and spatial dimension. In second part of the analysis, we run linear regression model to detect statistically significant indicators that are on the background of the overall inpatients satisfaction with provided healthcare services. Analysis was done in Statistical Package for the Social Sciences software (SPSS).

4. Analysis

Firs of all we plot in the Figure 1 mean overall inpatients satisfaction during the period of 2018–2021. University hospitals are ploted by grey color, general hospitals by black and the red line outline the average for whole sample. Despite the fact that majority of observations are close to the average value, some extreme values can be spoted. The lowest values in terms of overall inpatient satisfaction can be found in case of Bratislava university hospital, Galanta, Levice and Piestany hospital. On the other hand, inpatients are most satisfied with healthcare services in Kosice-Saca hospital, Stara Lubovna and Ruzomberok university hospital.

As far as regional disparities in satisfaction with provided healthcare are concerned, we divide the inpatients satisfaction into homogeneous groups, with respect to number of hospitals within region and thus we obtain three intervals of inpatient satisfaction: [6; 30], [31; 55] and [56; 100]. Figure 2 propose an overview of the overall inpatient satisfaction with respect to spatial dimension, resp. with respect to region, where the healthcare facility is located. It can be concluded that hospitals with lowest level of inpatient satisfaction are in Bratislava region. Subsequently we define the cluster of hospitals where inpatients are mid satisfied with provided healthcare services. In second cluster, hospitals from Banska Bystrica region, Trencin region, Trnava region and Nitra region are present. Finally, highest values of inpatients satisfaction are found in hospitals located in Zilina region, and Presov region. Hospitals from Kosice region are somehow in between of cluster of mid and highly satisfied inpatients.

In following part of analysis, we look closer on selected characteristics of healthcare facilities in relation to inpatient satisfaction. First, we plot on the Figure 3 the relationship between number of inpatients per doctor and the overall inpatient satisfaction. Blue and red lines outline the average values of variables and grey line depicts
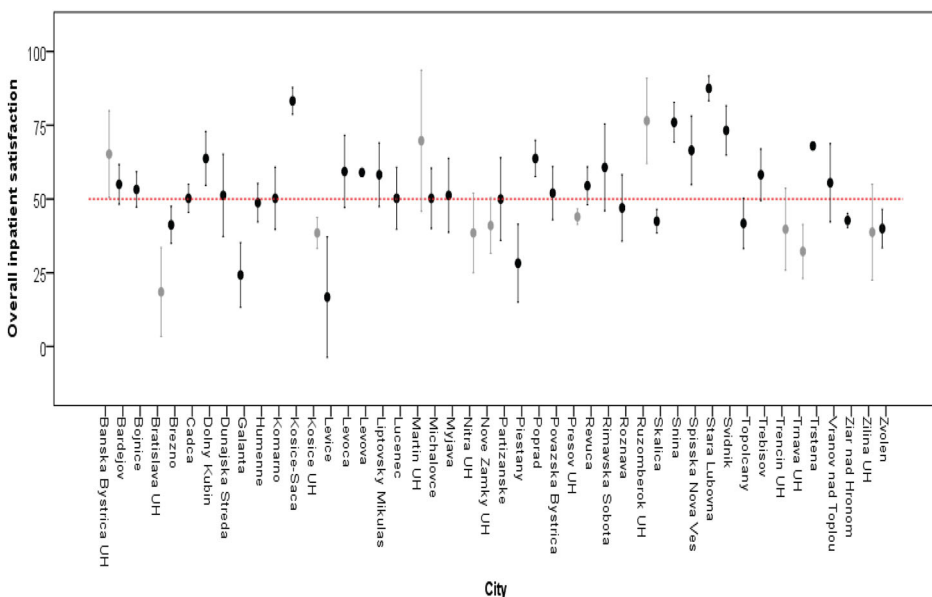

Figure 1. Overall inpatient satisfaction.
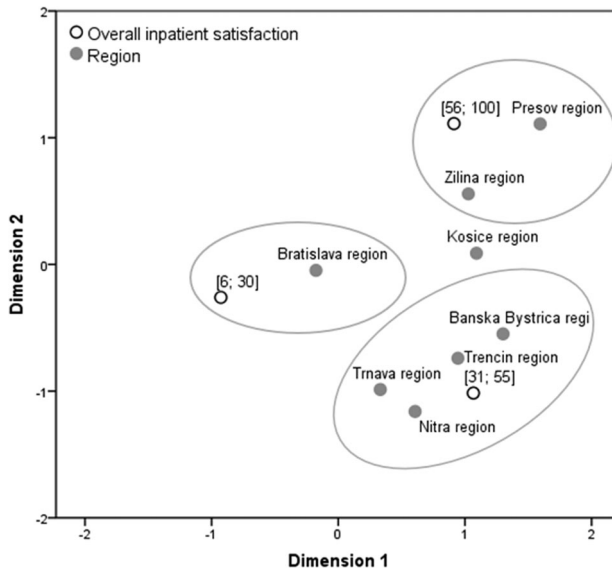Source: own sourcing

Figure 2. Spatial aspect of overall inpatient satisfaction.
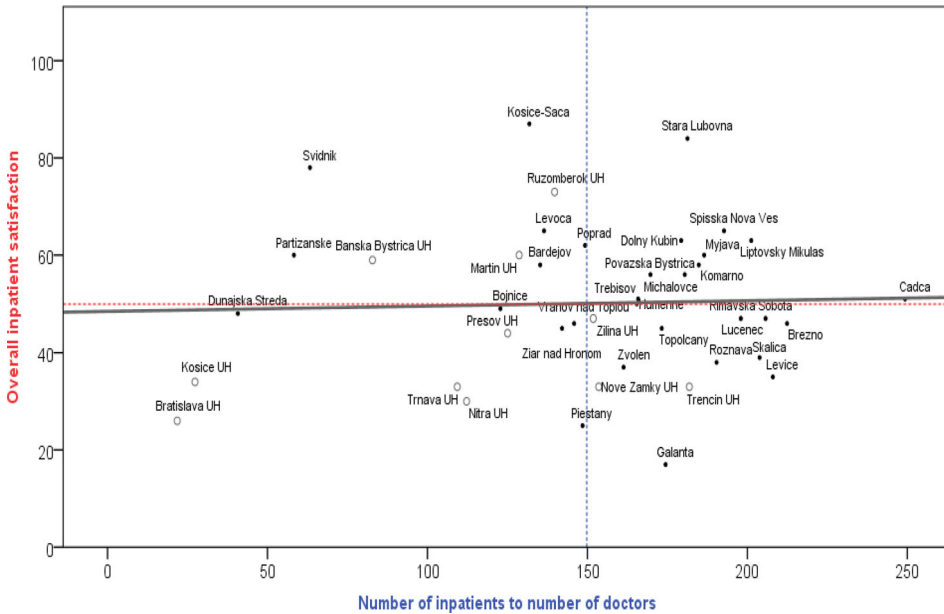Source: own sourcing

Figure 3. Number of inpatients to doctors and satisfaction.
Source: own sourcing

linear relationship between patients per doctor ratio and overall inpatient satisfaction. As the fitted line is completely flat, we conclude that there is no significant change in inpatient satisfaction that could be caused by differences in number of inpatients per doctor. Following, we note that there exists substantial difference in number of inpatients per doctors across sample. Lowest ratios of patients to doctors can be spotted
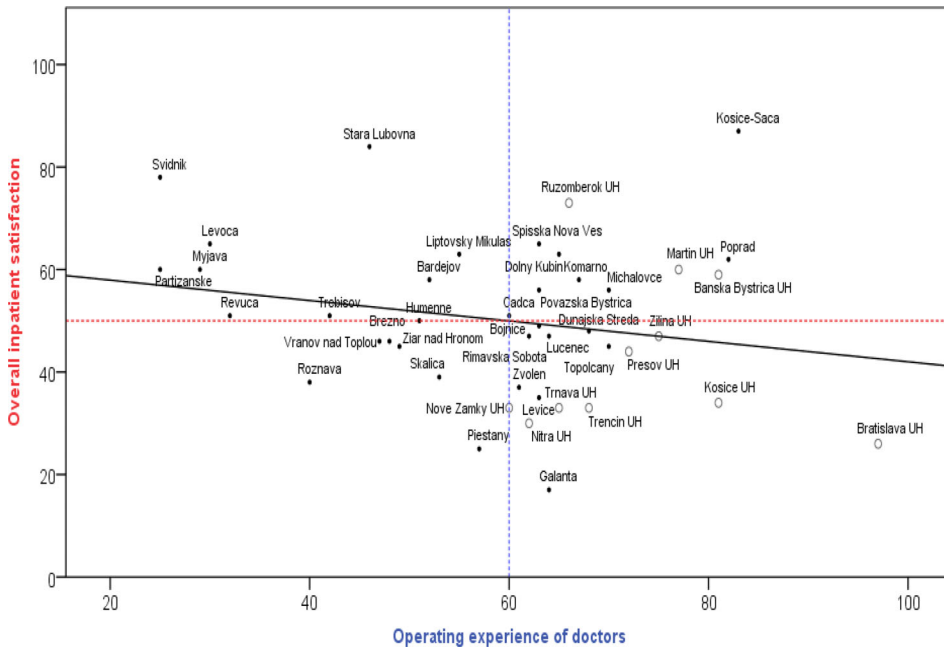
Figure 4. Operating experience and inpatient satisfaction.
Source: own sourcing

in left bottom corner of the Figure 3, where exclusively university hospitals are present and surprisingly the overall inpatient satisfaction is low. Relatively high satisfaction, and small number of inpatients to number of doctors are present in Banska Bystrica university hospital, Partizanske and Snina hospital.

High values in terms of number of inpatients per doctors are found in majority of hospitals in Slovakia. Those hospitals are situated on the right of blue line. Among those, lowest inpatient satisfaction has been measured in Galanta, Piestany and Trencin hospitals. On the other hand, highest values of inpatient satisfaction despite relatively high number of inpatients per doctors can be spotted in Kosice-Saca hospital and Ruzomberok university hospital.

As for the operating experience of doctors and its impact on overall inpatient satisfaction, patterns are captured on the Figure 4. Blue and red line outline the average values of variables and grey line depicts linear relationship between operating experience of doctors and overall inpatient satisfaction. First, we focus our attention on the slope of the fitted line, which is negative, thus there exists the negative relationship between complexity of provided healthcare and the overall inpatient satisfaction. Once again, we find homogenous cluster of university hospitals on the right bottom part of the Figure 4. This cluster is characterised by relatively low overall inpatient satisfaction, but high operating experience of doctors, resp. high complexity of provided healthcare services. Low operating experience of doctors, resp. small complexity of provided healthcare services associated with relatively high values of satisfaction is observed mostly in hospitals from northeast Slovakia. High complexity of provided healthcare services and high inpatients satisfaction is present in Kosice-Saca hospital. In relation to operating experience of doctors, it can be deduced that specialisation of
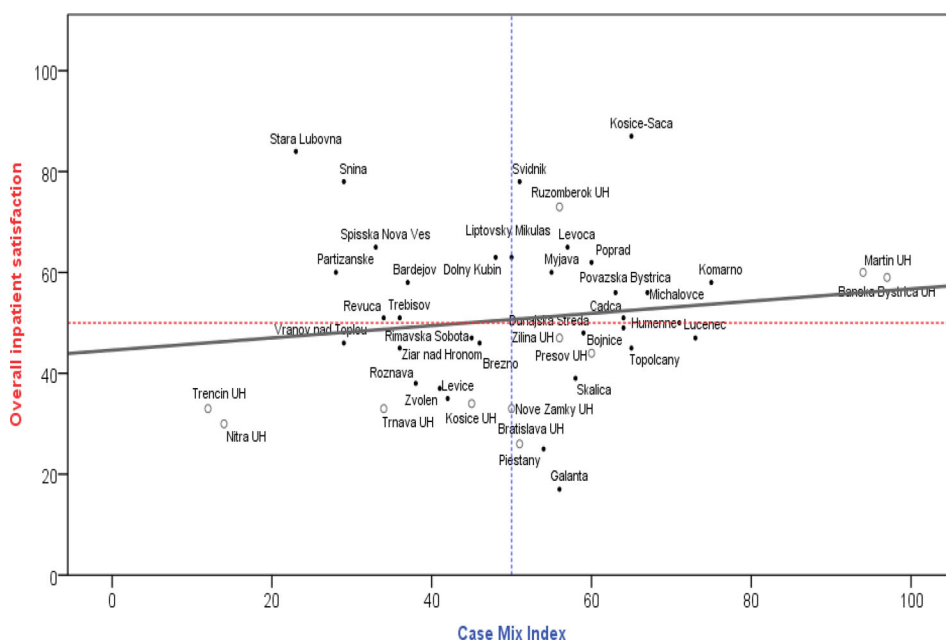
Figure 5. Case mix index and inpatient satisfaction.
Source: own sourcing

the hospitals should have positive effect on inpatients satisfaction, whilst complexity of provided medical procedures reduce the inpatients satisfaction.

Case mix index variable expresses the average economic and medical demands of inpatients over a time. The relationship between average economic-medical demands of treated diagnosis within hospital and the overall impatient satisfaction is plotted on the Figure 5. Red and blue line outline the average values of concerned variables and grey line depicts linear relationship between case mix index and overall inpatient satisfaction. Firstly, the slope of fitted line is positive, what can be interpreted as a positive dependency between the complexity and severity of treated diagnosis and the overall inpatient satisfaction. If we generalise, we could say that in hospitals where inpatients with the most demanding diagnoses are treated, the level of inpatients satisfaction is higher as compared to hospitals where less severe diagnoses are treated. Lowest case mix index values and inpatient satisfaction are present in Trencin and Nitra university hospital. On the other hand, most demanding diagnoses and relatively high values of inpatient satisfaction are observed in Martin and Banska Bystrica university hospitals.

Second part of the analysis is devoted to regression analysis which aim is to reveal the variables which influence mostly the overall inpatients satisfaction. Regression analysis has following equation

$$Overall\ inpatient\ satisfaction = \beta_0 + \sum_{i=1}^{n} \beta_i \times x_i + \varepsilon_i \qquad (1)$$

- β_0 is and intercept
- β_i are the estimated regression coefficients

- X_i are the set of explanatory variables
- ε_i error term

As for the set of explanatory variables from the X_i, at the beginning of the econometric modelling we assumed all possible explanatory variables that are present in the ranking, plus basic information about healthcare facilities. Initial list of explanatory variables included following variables: Total number of inpatients, Total number of operated inpatients, Number of doctors, Number of nurses, Number of inpatients per doctor, Number of inpatients per nurses, Number of operated inpatients per doctor, Number of operated inpatients per nurse, Reoperation, Total rehospitalization within 30 days, Postoperative mortality, Mortality due to acute stroke, Femur fracture mortality (65+ years), Intensive care unit mortality, Inpatient mortality after transfer from intensive care unit, Emergency waiting time, Fines from the Health Care Surveillance Authority, Evidence-based hospital referrals, Case Mix Index, Ability to generate own resources, Overdue debt and its year on year change, Transparency index.

Final, resp. best fitted regression model has following equation:

$$Overall\ inpatient\ satisfaction = \beta_0 + \beta_1 Type\ of\ hospital_i + \beta_2 Hospitalized\ inpatients_i$$
$$+\ \beta_3 Operated\ inpatients\ to\ number\ of\ nurses_i$$
$$+\ \beta_4 Quality\ of\ health\ care\ _i + \beta_5 Reoperation_i$$
$$+\ \beta_6 Total\ rehospitalization\ within\ 30\ days_i$$
$$+\ \beta_7 Overall\ rating_i +\ \varepsilon_i$$

$$(2)$$

Regression analysis results, resp. regression coefficients are in Table 2, where only statistically significant regression coefficients are present.

As far as type of hospital is concerned, the regression analysis revealed, that inpatients in general hospitals tend to be less satisfied with provided healthcare as inpatients that were treated in university hospitals. Total number of hospitalised

Table 2. Regression model.

Parameter	B	Std. error	95% wald confidence interval		Hypothesis test		
			Lower	Upper	Wald Chi-square	df	Sig.
(Intercept)	47.531	6.9796	33.851	61.211	46.376	1	.000
[Type of hospital = General hospital]	−5.553	2.6321	−10.712	-.394	4.450	1	.035
[Type of hospital = University Hospital]	0ᵃ	.	.	.	.	.	.
Hospitalized inpatients	-.001	.0001	-.001	.000	32.403	1	.000
Operated inpatients to number of nurses	-.695	.2011	−1.089	-.301	11.954	1	.001
Quality of health care	1.157	.1351	.892	1.422	73.356	1	.000
Reoperation	-.302	.0643	-.428	-.176	22.057	1	.000
Total rehospitalization within 30 days	-.356	.0743	-.501	-.210	22.918	1	.000
Overall rating	5.332	.0681	5.199	5.466	6133.101	1	.000

Dependent variable: Inpatient satisfaction
Model: (intercept), type of hospital, hospitalized inpatients, operated to nurses, quality, Reoperation, Total rehospitalization within 30 days, Overall rating
a. Set to zero because this parameter is redundant.
Source: own sourcing

inpatients influence the overall inpatients satisfaction in negative, although to a very small extent, and therefore the higher number of inpatients are associated with marinally lower overall inpatients satisfaction. Overall inpatient satisfaction is negatively associated with increasing number of operated inpatients per nurse, meaning that the higher number of operated inpatents per nurse reduce overall inpatient satisfaction with provided healthcae. Overall quality of healthcare indicator is linked positively to overall inpatient satisfaction, meaning that the higher quality of provided healthcare is, higher overall inpatient satisfaction is. The overall satisfaction of hospitalized patients is negatively associated with reoperation and total rehospitalization within 30 days. We document strong effect of overall rating of the hospital on overall inpatient satisfaction, what proves that inpatients satisfaction is highly determined by overall performacne of the hospital.

5. Discussion

Measurement and evaluation of the patient satisfaction have become an integral part of the measuring systems for the quality and the efficiency of the health systems in the individual countries. The process of demographic aging, the unfavourable development of the number of the chronic noncommunicable diseases, as well as their successful treatment determined by the technological development and innovation influence the growing expectations of the patients and their belief in the quality healthcare service too. While the technological developments and the innovations in the healthcare system prolong the life expectancy of the population, a forecast for the sustainability of the health system is critical (Ferrand et al., 2016; Briestenský & Ključnikov, 2019). The health systems of the individual countries are also significantly affected by the current coronavirus disease 2019 pandemic crisis that makes the economies and of the countries all over the world weaker and more vulnerable (Besenyő & Kármán, 2020). Thus, an attention is drawn to the development of the systems for measuring quality and efficiency, the systems for risk and crisis situation management in the healthcare system, as well as the discovery of reserves for increasing the efficiency of the health system (Hadad et al., 2013; Kozlova et al., 2017; White-Means et al., 2019). The patient satisfaction has been a research dimension for the recent two decades considerably often and it has been investigated from an organisational and procedural point of view primarily. The various methodologies are developed, whose standardisation is very difficult due to the strong heterogeneity of the health system as a whole and within it also the entities providing a wide range of the healthcare services behave in a different way. The dissimilar concepts are also established within the individual countries that reflect the availability of the national databases. Usually, they are related to the databases created from the primary data collection from the individual territories or from the individual types of the healthcare providers (Culyer & Wagstaff, 1993; Clancy et al., 2014; Ineveld et al., 2016; Kohl et al., 2019).

There are no standardised concepts and a system of a national comparison of the patient satisfaction assessment from the individual healthcare providers in the conditions of the Slovak Republic. The partial analyses, which have taken place in the

recent years originate in the various associations and the non-profit sector, promote the quality of the healthcare provision and thus, they put pressure on its better availability.

Many national databases created in the health system of the Slovak Republic are not able to exploit their potential analytical benefit sufficiently that would help to enhance the processes in the healthcare facilities in order to get the quality and the efficiency of healthcare service at a higher level. The National Health Information Centre (NHIC) founded by the Ministry of Health of the Slovak Republic does not gather and does not centralise the information of patient satisfaction in the individual health facilities. Patients satisfaction is examined and regularly evaluated by the Slovak health insurance companies. Such results help health insurance companies in entering into contractual agreements with healthcare providers. Also, these results help to increase motivation in order to improve the quality of healthcare and the image of health facilities, etc. In future, it is important to create complex evaluating systems that would examine individual aspects of healthcare in more details in order to improve the quality of healthcare. These authors, Ferrand et al. (2016), Gardner et al. (2018), Batbaatar et al. (2016) and others, emphasize in their studies the above-mentioned facts. Activities of research teams, that would also support a formation of national comparative platform and a development of national and international benchmarking indicators, may play significant role in this entire process.

This research study uses data published by the Institute for Economic and Social Reforms (INEKO, 2021) within which hospitalized inpatients satisfaction in the Slovak Republic had been examined. Patients satisfaction during 2018–2021 was examined, while data were analysed from 11 university hospitals and 33 general hospitals in the Slovak republic. The analyses results show that, in average, there do not exist any significant differences in satisfaction of inpatients with provided healthcare. However, there exist hospitals, where these differences are very strong. Type of hospitals by ownership play an important role as there exist many differences in a satisfaction of patients who are treated in public and private hospitals (e.g. Fatima et al., 2018; Örsal et al., 2019; Pacáková & Kopecká, 2018; Marcinowicz et al., 2009). Similarly, physical support and contact personnel have significantly more positive impact on patient satisfaction (Ramli, 2019).

Geographical aspects play an important role in patient satisfaction, too. The lowest level of inpatients satisfaction with provided healthcare was observed in hospitals in Bratislava region; medium-high satisfaction of inpatients was dominant in hospitals in Banska Bystrica region, Trnava region, Trenčin region and Nitra region. The highest level of inpatients satisfaction with provided healthcare was found out in hospitals in Prešov region and Žilina region. Numerous research studies confirm a significance of geographical aspects in evaluating patient satisfaction (Bem et al., 2019; Batbaatar et al., 2017; Briestenský & Ključnikov, 2019; Mackenbach et al., 2011).

The analyses results did not confirm any existence of a relationship between a number of patients per 1 physician and a satisfaction of inpatients with provided healthcare. However, there was found out a negative relationship between a complexity of provided healthcare in a hospital and a satisfaction of inpatients in a given hospital. The less complex was an offer of medical procedures, the more satisfied were

inpatients with a particular hospital. The Case Mix Index (economic-medical severity level of inpatients in hospitals) was positively correlated with inpatients satisfaction. These findings correspond with study results by Janicijevic et al. (2013) and Lobo Prabhu et al. (2018).

Regression analysis results show that there was a higher inpatients satisfaction with provided healthcare in university hospitals than in general hospitals. Overall healthcare quality and overall hospital rating positively influence inpatients satisfaction. On the other hand, reoperation, rehospitalization within 30 days, rate of operated hospitalized inpatients to number of nurses and overall number of hospitalized inpatients negatively influence hospitalized inpatients satisfaction with provided healthcare. This fact emphasizes a significance of researching patient satisfaction within individual groups of diagnoses, and also within individual hospital departments (Batbaatar et al. 2016; Bolink et al., 2015; Barfield et al., 2020).

6. Conclusion

Objective of the study is to investigate the factors that influence the inpatients satisfaction with healthcare facilities, where they were treated. The results of this study provide a valuable platform and thus, it should help the healthcare facilities managers in particular to design the efficient strategies for improving the healthcare quality for patients. They also enable the healthcare facility management to pay more attention to the quality of healthcare service in the individual organisation and to address the shortcomings that result in a gradual reduction in the patient loyalty, the healthcare facility personnel loyalty, as well as a creation of the disparities in the healthcare demand across the individual territories. All the dimensions should be paid more attention in order to be analysed more precisely. But access to the more structured data is necessary to go through them. Regular monitoring of the patient satisfaction would allow not only to evaluate the healthcare quality as an aggregate indicator, but also to specify and to monitor the important causal relationships within the healthcare providers and thus, to observe the quality of the processes, the employee satisfaction, the financial aspects of the healthcare provider, and so forth. All these steps would allow the development of the national and regional benchmarking indicators that are necessary for standardisation processes for an international comparison. There is to note that this analytical study is limited by several restrictions. First of all, the data accessibility and the data availability are quite complicated as such a data collection that would evaluate a perception of the healthcare facilities from an angle of view of the patients meaning regarding a customer aspect. The design of the data collection and the survey is not compatible with the other international surveys. Another limitation could be a proportionality of the answers – from a territorial point of view regarding the healthcare facilities. Another point is an accessibility of the data set. The discussed parameters are not able to be assigned to the other indicators of the healthcare facilities – for instance, the economic ones.

In addition to the healthcare provider, monitoring of the patient satisfaction should also involve the other participants of the healthcare system, namely the health insurance companies and regulators that influence the processes taking place in the

healthcare facilities and the formalised contractual relationships necessary within the financial mechanisms of the healthcare system. From a regional point of view, the analysis outcome supports the implementation of the regional strategic plans within the individual territorial units of the country and also a better assessment of the availability and a rate of the inpatient migration between the territorial units that is determined by demand for highly specialised or quality healthcare service lacking in the particular region.

Disclosure statement

No potential conflict of interest was reported by the authors.

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