Identification of the Key Factors for Successful Hospital Management in Slovakia

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BACKGROUND: We can find many types of hospitals, such as state-owned, private, and also specialized institutions, such as those that focus on addictology. If managers want to manage hospitals successfully, they need to know the factors that most affect other processes, and they need to know the factors that are most affected so that they can use them to measure the success of their management. **AIM:** The aim of this paper is to identify the factors involved in the success of hospital management in Slovakia. **METHODS:** After a literature review, we selected 11 of the main success factors of hospital management, including: patient satisfaction, measured by the number of justified legal complaints; errors and incidents; percentage of readmissions; nosocomial infections in a hospital; mortality; employee satisfaction with working conditions; use of modern equipment; waiting time; length of stay; average cost per bed and day for medicines and materials, and ratio of capital expenditure to total cost. To identify the main factors, we asked experts on hospital management in Slovakia to use the DEMATEL technique to evaluate results. **RESULTS:** After the evaluation of the research we find that the three most important factors are the percentage of readmissions, average cost per bed and day for medicines and materials, and nosocomial infections in a hospital. **CONCLUSION:** The results of our research suggest that managers should focus most on reducing the percentage of readmissions in order to increase the quality of healthcare delivery.

Keywords | Hospitals – Hospitals in Slovakia – Key Factors in Hospital Management – DEMATEL and Healthcare

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● 1 BACKGROUND

Everyone is confronted with the healthcare delivery system in a certain way. Government interventions in the provision of healthcare can occur through the economy, healthcare providers, doctors and medical staff, and so on. The provision of healthcare is represented by a set consisting of services and products, as well as the institution and regulation of stakeholders (Phelps, 2016).

Hospitals in Eastern and Central Europe urgently need a reform of the hospital management system. Changes in these countries are being made very slowly (Beaglehole & Bonita, 2004). The diversity of healthcare provision can also be seen from a historical perspective, when Europe was divided into the Eastern and Western blocs. This division had a negative effect on healthcare provision and hospital management. Hospitals are currently trying to make up for this gap, but the consequences are still visible.

A similar view emerged from a study based on the European Social Survey in 2008 and 2009, which focused on health systems in the European Union. Satisfaction is low in Eastern European and former Soviet countries. At the same time, according to the results of the survey, the healthcare provided by the state may be in the interests of everyone (Missine et al., 2013). There are several similar references in the literature and the authors agree that this impact is significant in terms of hospital management.

The weakest aspect of healthcare in Slovakia is hospitals. The biggest problems include: demotivation of employees, outdated equipment, insufficient healthcare for chronically ill patients, and a regulated system of health insurance companies with non-existent competition. The loss of hospitals in Slovakia is also identified as a problem (Šoltés & Gavurová, 2014). These problems are also known to the general public, as the provision of healthcare is a public service commonly encountered by the public.

Hospitals in Slovakia are mostly undercapitalized and run at a loss; if they are state-owned, they usually require debt relief every three years (Pažitný et al., 2014). This points to unsystematic problem-solving, with debt relief being performed instead of strategic problem-solving. As practice has shown, hospital debt relief has not had the desired effect, as the funds have been used to reduce debt instead of supporting strategic areas. In this case, it is only a temporary solution to the problem, because debt is constantly being generated.

Analysis of institution for financial policy points to the deteriorating condition of Slovak hospitals, mainly as a result of reduced healthcare expenditure, while in Czech hospitals, there has been no improved outcome. According to the analysis, Slovakia achieves the worst results among the OECD countries, together with Hungary (i-health.sk, 2015).

This article is focused on the management of hospitals in Slovakia and is based on information provided by professionals in hospital management. The aim of this paper is to identify the success factors for hospital management in Slovakia. The paper has the following structure. The first part is focused on a review of the literature from professional Slovak and foreign sources on the management of hospitals and the healthcare situation in Slovakia. In the second part we describe the methodology used, together with selected key factors in hospital management. In the third part, the results of the research are presented and in the last part, there is discussion and the conclusions of our study.

1.1 Success factors in Slovak hospitals

According to the performance evaluation of the V4 countries V4 countries, the Czech Republic is the best, followed by the Slovak Republic and Poland, and the worst is Hungary. All the V4 countries need to put in place a better methodology for measuring their performance, as without that it is not possible to measure the extent to which reforms are successful and whether their objectives have been met (Hejduková & Kureková, 2014).

OECD statistics can be used to examine funding. These show the amount of state funds spent on healthcare, expressed as a percentage of GDP. In 2017, Slovakia had expenditure of 6.7% of GDP. The average of the countries of the European Union has been in the range of 9.9% in recent years (ec.europa.eu, 2020). In 2017, Slovakia spent EUR 1,600 per person on health (adjusted for differences in purchasing power), which is more than 40% less than the EU average (OECD, 2019). The only way out may be to increase the share of expenditure in GDP, as is the case in developed countries, and to direct this expenditure to strategic areas. The selection of relevant strategic areas could be the subject of future scientific research and extensive analysis.

There is a system in Slovakia that uses a combination of models: the Bismarsk, Beveridge, and National Healthcare Models. All expenses are covered by insurance companies, but 30% of the total healthcare cost comes from households. Insurance companies have a limit on the funds spent, which is determined for individual health care providers (Biernacki et al., 2017). Every healthcare financing system guides the quality and quantity of measures taken. For a complete analysis that will provide an input for research, it is necessary to know the method of financing and its limits.

The success of a hospital cannot be measured as easily as that of ordinary business entities. They need to be evaluated by some factors such as the financing and quality of healthcare. Evaluation is a complex process consisting of many parts (Rahimi et al., 2017). Key performance factors of healthcare organizations include the following: a financial analysis indicator, budgeting process indicators, costing system, customer satisfaction, quality of services, numbers of errors, process efficiency, process utilization rate, personnel satisfaction, and staff training and education (Popesko et al., 2012).

Countries with better healthcare have higher life expectancy and lower child mortality (Ortiz-Ospina & Roser, 2017). When one analyses the OECD databases of the European Union or the WHO, it can be seen that the statistics also indicate the mortality rate for diseases that can be cured and the prevention of needless deaths. However, measurements of the starting years of life or measuring the life expectancy of the population are sometimes used.

We can find many types of hospitals: general, specialized, state-owned, private, not-for-profit hospitals, and for-profit hospitals. Each of these types achieves different results (Kao et al., 2020). In general hospitals, patients can get most types of healthcare. Specialized hospitals focus on selected problems. If we want to find the success factors for hospital management in specialized hospitals, we can use general factors, but we must add factors that we can measure in a specialized one. In hospitals focused on addictology, we need to consider factors connected with mental healthcare systems (Laqueille et al., 2018).

Using WHO databases, we can use standardized factors in measuring the effectiveness of hospitals, such as the age-standardized mortality rate, life expectancy at birth or at ages 1, 15, 45, and 65, infant mortality rate, total health expenditure as a percentage of gross domestic product (GDP), and healthy life years at age 65 (WHO, 2020). IBM mainly focuses on four types of performance measurements: the quality and efficiency of patient care, cost of healthcare services, disparities in performance, and care outcomes (IBM, 2020). In addition to the above-mentioned indicators, we can find some others, such as readmissions (Hoyer et al., 2018), nosocomial infections in hospitals (Zerganipour et al., 2016), waiting time (Spechbach et al., 2019), etc.

An extensive analysis of 542 expert citations in the field of hospital evaluation found that hospital performance can best be measured through patient mortality rates. Therefore, the measurement of performance should focus on the results achieved in patients (Werner et al., 2006). We must look at hospitals as organizations whose goal is the health of the population. For this reason, in addition to the analysis of financial indicators, these factors must not be neglected in the examination.

In the literature, we can find many factors in healthcare management. Healthcare providers must focus on the quality of healthcare instead of its quantity, as it can influence other factors such as mortality and readmissions (Doyle et al., 2016). Most countries collect data to evaluate the quality of healthcare. In addition to countries, data is also collected by the World Health Organization, European Union, OECD, and others (Quentin, 2019). Data is collected and compared on many levels. But we must consider that each country can have differences, such as financing models and the structures of healthcare providers.

Patient satisfaction relates to the measurement of patient satisfaction on the basis of the number of justified legal complaints per 1000 patients per year. It relates to the negative experiences of patients in connection with the provision of healthcare, as well as to the safety-related problems of hospitals (Reader et al., 2014). Patients' complaints usually relate to the human rather than the technical aspects of care, and therefore this criterion can be used to evaluate its quality (Mack et al., 2017).

Errors and incidents map incidents in the provision of healthcare. According to the Harvard Medical Practice Study, 90% of errors are judged to be preventable (Leape et al., 1991). For this reason, error analysis can be considered as a tool to prevent others, leading to quality improvements.

The percentage of readmissions is generally determined by the 30-day risk-standardized readmission rate (Herrin et al., 2015). But some other studies use a shorter period than 30 days (Chin et al., 2016).

The next factor is nosocomial infections, which are defined as infections occurring more than 48 hours after admission, which are usually considered nosocomial (Zerganipour et al., 2016). As these infections are associated with healthcare, they can be considered as one of the indicators of quality.

Mortality is measured by the number of deaths in a healthcare organization per 1000 patients. As mentioned in the literature review, this factor is used by the WHO as a standardized rate.

Employee satisfaction with working conditions affects employees' performance and quality of work (Bejtkovsky, 2018). We can measure it by employee fluctuation, as healthcare nursing professions are mostly affected by it (Zacharova & Kozon, 2019).

The use of modern equipment is considered in some studies as a factor of quality (Kitapci et al., 2014). As medicine is still improving, we can use this factor to find out how much it can influence the quality of healthcare.

Waiting time is used to measure patient satisfaction. A longer waiting time is usually associated with a lower level of patient satisfaction (Bleustein et al., 2014).

The length of stay is a frequently used indicator, as it refers to hospital performance. If the length of stay is longer than expected, it is associated with lower quality (Barrasa-Villar et al., 2017).

The average cost per bed and day for medicines and materials is a standardized indicator which is used in financial analysis, mostly by financial managers. It can be used to measure the financial performance of hospitals (Cleverley et al., 2017)

The ratio of capital expenditure to total costs is another factor used to measure hospital performance from the financial point of view (Rahimi et al., 2017).

Several research studies deal with the financing of hospitals as a key factor that significantly affects the whole process.

This assumption arose mainly as a result of the presence of insufficient funding and negative evaluation of management. But we need to verify, which areas of hospital management does it influence. With regard to financing, it is possible to examine not only the amount of funds spent, but also their use. For this reason, the study may focus not only on the ratio of capital expenditure to costs, but also on average expenditure per bed and day per drug and patient.

Several authors, as mentioned, refer to the mortality rate as an important indicator of the quality of healthcare. For this reason, a hypothesis has been established which will verify the extent to which this factor is influenced by others and thus the extent to which this indicator is authoritative when considered separately.

● 2 METHODS

After conducting a literature review, this research focused on 11 selected factors that may affect the success of hospital management in Slovakia: patient satisfaction measured by the number of justified legal complaints (F1), errors and incidents (F2), percentage of readmissions (F3), nosocomial infections in a hospital (F4), mortality (F5), employee satisfaction with working conditions (F6), use of modern equipment (F7), waiting time (F8) , length of stay (F9), average cost per bed and day for medicines and materials (F10), and ratio of capital expenditure to total cost (F11).

The aim of this article is to identify the key factors that affect the success of hospital management in Slovakia. According to the analysis of the domestic and foreign scientific literature, the main areas of research into the management of hospitals that are focused on are financing and the mortality of patients in healthcare organizations.

On the basis of these findings, the following hypotheses were formulated:

H1: One of the most important factors influencing the provision of healthcare is the amount of money spent.

H2: Patient mortality in a healthcare organization is one of the important indicators of healthcare delivery.

We found eight experts with long-term experience of working in healthcare who can evaluate the individual processes and their mutual influence correctly, and approached them in order to carry out the research. If the chosen people were not experts, their answers would not bring any significant results. The evaluation of data can be used as conformation tool, which confirms that selected people are experts. If they were not experts, the obtained results would not be statistically significant. Using their knowledge, it is possible to verify the validity of the selected conclusions. From among the selected experts, all answered the selected questions. The data was collected at the beginning of the year 2020 in electronic form. The experts were asked to answer questions focused on hospitals in general, as we wanted to find signif-

icant factors for hospital management in general. General factors can also be partly applied in specialized hospitals.

To evaluate the experts' answers, we used a method called DEMATL – Decision Making Trial and Evaluation Laboratory. DEMATEL was developed in the years 1972–1976 (Mowen et al., 1993). This method can be used to evaluate the mutual influence between selected factors (Tianshui et al., 2014). The analysis of selected factors with DEMATEL can create groups of factors and their causes and effects and their mutual influence (Tsai et al., 2009). DEMATEL has been used in some studies to evaluate factors in healthcare (Shieh et al., 2010).

In the first step, we consider n factors F_1, F_2, F_3, ... F_n, and experts E_1, E_2, E_3, ... E_n. The experts quantify the direct effect of the factor F_i on the factor F_j (i, j = 1, 2, 3, ... 11). They use a rating scale (0 – no impact, 1 – low impact, 2 – medium impact, 3 – high impact, and 4 – very high impact) to evaluate the significance of the factors.

From the experts' evaluations, we created direct influence matrices. By gathering expert opinions, we obtained a matrix of the direct influence of the group:

$$Z = \left(z_{ij} \right); \; z_{ij} = \frac{1}{m} \sum_{k=1}^{m} z_{ij}^{k}; \; i, j = 1, \; 2, \; \ldots, \; n.$$

By means of the following transformation, we can get the normalized direct influence matrix:

$$X = \frac{1}{s} Z; \; s = \max\left\{ \max_{1 \le i \le n} \sum_{j=1}^{n} z_{ij}, \max_{1 \le j \le n} \sum_{i=1}^{n} z_{ij} \right\}.$$

The answers in the direct influence matrix are the arithmetic mean of the experts' answers (Stehlíková et al., 2009).

By using the normalized matrix of direct influence, and by adding all direct and indirect effects, we can calculate a total influence matrix T = (t_{ij})

$$T = X + X^2 + \ldots + X^h = X\left(I - X \right)^{-1}, \; for \; h \to \infty.$$

"I" is a unit matrix.

After calculation, we compiled an influential relation map (IRM). R is the vector of the sums of the individual columns and C is the vector of the sums of the individual columns of the matrix T.

$$R = \left(r_i \right) = \left(\sum_{j=1}^{n} t_{ij} \right); \; i = 1, \; \ldots, \; n$$

and

$$C = \left(c_i \right) = \left(\sum_{i=1}^{n} t_{ij} \right); \; j = 1, \; \ldots, \; n.$$

As a final step, we can calculate the weight of importance of i by using the calculation

$$w_i = \frac{r_i + c_i}{\sum_{i=1}^{n} \left(r_i + c_i \right)}; \; i = 1, \; 2, \; \ldots, \; n.$$

Values c_j, where j = 1, ..., n represent the sum of the direct and indirect effects that the factor F_j receives from other factors.

Values r_i, where i = 1, ..., n represent the sum of the direct and indirect effects that depend on the factor F_i towards other factors.

Values $r_i + c_i$, where i = 1, ..., n represent the degree of a central role. The higher the degree of centrality is, the more important the factor is.

Values $r_i - c_i$, where i = 1, ..., n shows the degree of relation. This relation shows us if a factor is in the cause or effect group. If the value is positive, then the selected factor is in the cause group; if negative, then the factor is in the effect group.

Using the values r+c and r-c we can create a graph consisting of four quadrants. The first quadrant consists of factors with important relationships and a high degree of importance. In the second quadrant, we have factors with a high degree of relationships, but of little importance. The third quadrant consists of factors with a low degree of relationships and little importance. In the fourth quadrant, there is a factor with a low degree of relationships, but high importance. These factors (fourth quadrant) cannot be influenced directly and we call them impact factors, as they are determined by other factors.

● 3 RESULTS

The results of research by means of the DEMATEL method are presented in the matrices Z (direct influence), X (normalized group of direct influence), and T (total influence).

$$X = \begin{bmatrix} 0 & 0.027 & 0.027 & 0.027 & 0.027 & 0.111 & 0.027 & 0.073 & 0.030 & 0.027 & 0.027 \\ 0.127 & 0 & 0.087 & 0.111 & 0.095 & 0.100 & 0.068 & 0.030 & 0.068 & 0.065 & 0.076 \\ 0.114 & 0.057 & 0 & 0.092 & 0.111 & 0.100 & 0.084 & 0.073 & 0.098 & 0.087 & 0.068 \\ 0.114 & 0.084 & 0.106 & 0 & 0.068 & 0.084 & 0.035 & 0.081 & 0.100 & 0.084 & 0.060 \\ 0.127 & 0.041 & 0.027 & 0.027 & 0 & 0.062 & 0.033 & 0.068 & 0.081 & 0.062 & 0.027 \\ 0.092 & 0.103 & 0.087 & 0.095 & 0.057 & 0 & 0.079 & 0.035 & 0.033 & 0.027 & 0.030 \\ 0.084 & 0.076 & 0.084 & 0.054 & 0.073 & 0.095 & 0 & 0.038 & 0.046 & 0.098 & 0.106 \\ 0.100 & 0.051 & 0.079 & 0.073 & 0.051 & 0.049 & 0.043 & 0 & 0.098 & 0.057 & 0.057 \\ 0.073 & 0.046 & 0.076 & 0.081 & 0.051 & 0.043 & 0.046 & 0.092 & 0 & 0.098 & 0.084 \\ 0.095 & 0.079 & 0.087 & 0.068 & 0.084 & 0.079 & 0.065 & 0.070 & 0.087 & 0 & 0.100 \\ 0.073 & 0.065 & 0.084 & 0.046 & 0.100 & 0.073 & 0.103 & 0.081 & 0.081 & 0.100 & 0 \end{bmatrix}$$

$$T = \begin{bmatrix} 0 & 0 & 0 & 0 & 0 & 0.202 & 0 & 0 & 0 & 0 & 0 \\ 0.362 & 0 & 0.261 & 0.269 & 0.263 & 0.296 & 0.209 & 0.195 & 0.240 & 0.232 & 0.224 \\ 0.364 & 0.221 & 0 & 0.262 & 0.284 & 0.305 & 0.231 & 0.243 & 0.277 & 0.262 & 0.228 \\ 0.348 & 0.233 & 0.277 & 0 & 0.239 & 0.278 & 0 & 0.240 & 0.269 & 0.248 & 0.211 \\ 0.276 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0.283 & 0.221 & 0.225 & 0.223 & 0.195 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0.308 & 0.220 & 0.249 & 0.209 & 0.236 & 0.278 & 0 & 0 & 0.210 & 0.251 & 0.243 \\ 0.291 & 0 & 0.221 & 0.205 & 0 & 0.210 & 0 & 0 & 0.235 & 0.195 & 0 \\ 0.281 & 0 & 0.230 & 0.221 & 0.203 & 0.216 & 0 & 0.230 & 0 & 0.241 & 0.215 \\ 0.332 & 0.230 & 0.262 & 0.231 & 0.255 & 0.274 & 0.208 & 0.230 & 0.258 & 0 & 0.247 \\ 0.312 & 0.217 & 0.258 & 0.211 & 0.268 & 0.268 & 0.240 & 0.238 & 0.252 & 0.264 & 0 \end{bmatrix}$$

The order of importance of the factors shows the value (r + c). On the evidence of the first table, the most important factor is the factor F3 (percentage of readmissions) with a value of 4.665; in order of importance, the other factors are: F10 (average cost per bed and day for medicines and materials) with a value of 4.218; F4 (nosocomial infections in a hospital) with a value of 4.177; F11 (ratio of capital expenditure to total cost), with a value of 3.897; F2 (errors and incidents), with a value of 3.893; F9 (length of stay), with a value of 3.577; F6 (employee satisfaction with working conditions), with a value of 3.474; F1 (patient satisfaction measured by the number of justified legal complaints), with a value of 3.359; F7 (use of modern equipment), with a value of 3.039; F8 (waiting time), with a value of 2.732, and F5 (mortality). The hypothesis H1 was accepted – the factor F10 (average cost per bed and day for medicines and materials) is the second most important factor and the factor F11 (ratio of capital expenditure to total cost) also has a high value. The cost of healthcare is a very important factor, as mentioned in the literature review. (*Table 1*.)

As mentioned in the literature review, some authors claim that the financing of hospitals in Slovakia is the main prob-

$$Z = \begin{bmatrix} 0.00 & 1.02 & 1.02 & 1.02 & 1.02 & 4.17 & 1.02 & 2.75 & 1.12 & 1.02 & 1.02 \\ 4.78 & 0.00 & 3.26 & 4.17 & 3.56 & 3.77 & 2.54 & 1.12 & 2.54 & 2.44 & 2.85 \\ 4.28 & 2.14 & 0.00 & 3.46 & 4.17 & 3.77 & 3.16 & 2.75 & 3.66 & 3.26 & 2.54 \\ 4.28 & 3.16 & 3.97 & 0.00 & 2.54 & 3.16 & 1.32 & 3.05 & 3.77 & 3.16 & 2.24 \\ 4.78 & 1.53 & 1.02 & 1.02 & 0.00 & 2.34 & 1.22 & 2.54 & 3.05 & 2.34 & 1.02 \\ 3.46 & 3.87 & 3.26 & 3.56 & 2.14 & 0.00 & 2.95 & 1.32 & 1.22 & 1.02 & 1.12 \\ 3.16 & 2.85 & 3.16 & 2.04 & 2.75 & 3.56 & 0.00 & 1.43 & 1.73 & 3.66 & 3.97 \\ 3.77 & 1.93 & 2.95 & 2.75 & 1.93 & 1.83 & 1.63 & 0.00 & 3.66 & 2.14 & 2.14 \\ 2.75 & 1.73 & 2.85 & 3.05 & 1.93 & 1.63 & 1.73 & 3.46 & 0.00 & 3.66 & 3.16 \\ 3.56 & 2.95 & 3.26 & 2.54 & 3.16 & 2.95 & 2.44 & 2.65 & 3.26 & 0.00 & 3.77 \\ 2.75 & 2.44 & 3.16 & 1.73 & 3.77 & 2.75 & 3.87 & 3.05 & 3.05 & 3.77 & 0.00 \end{bmatrix}$$

	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	R	C	C+R	R-C
F1	0	0	0	0	0	0.202	0	0	0	0	0	0.202	3.157	3.359	-2.95
F2	0.362	0	0.261	0.269	0.263	0.296	0.209	0.195	0.24	0.232	0.224	2.551	1.342	3.893	1.209
F3	0.364	0.221	0	0.262	0.287	0.305	0.231	0.243	0.277	0.262	0.228	2.681	1.984	4.665	0.697
F4	0.348	0.233	0.277	0	0.239	0.278	0	0.24	0.269	0.248	0.211	2.344	1.832	4.177	0.512
F5	0.276	0	0	0	0	0	0	0	0	0	0	0.276	1.947	2.223	-1.67
F6	0.283	0.221	0.225	0.223	0.195	0	0	0	0	0	0	1.147	2.327	3.474	-1.18
F7	0.308	0.22	0.249	0.209	0.236	0.278	0	0	0.21	0.251	0.243	2.204	0.889	3.093	1.315
F8	0.291	0	0.221	0.205	0	0.21	0	0	0.235	0.195	0	1.356	1.376	2.732	-0.02
F9	0.281	0	0.23	0.221	0.203	0.216	0	0.23	0	0.241	0.215	1.836	1.741	3.577	0.096
F10	0.332	0.23	0.262	0.231	0.255	0.274	0.208	0.23	0.258	0	0.247	2.526	1.693	4.218	0.833
F11	0.312	0.217	0.258	0.211	0.268	0.268	0.24	0.238	0.252	0.264	0	2.53	1.367	3.897	1.162
C	3.157	1.342	1.984	1.832	1.947	2.327	0.889	1.376	1.741	1.693	1.367				

Table 1 | Total relation matrix and the causal influence levels
Source: authors' own calculations

lem. From their point of view, a higher percentage of gross domestic product should be spent on hospitals to improve them. After our research, we can confirm this view, as the financing of hospitals in Slovakia is a very important issue. If managers have a higher budget, they can buy new equipment and have more healthcare professionals and thus reduce waiting times.

Percentage of readmissions is the most important factor in showing us the quality of healthcare. The lower the percentage, the more it indicates better care, as patients do not return to the hospital with their problem unresolved. *Nosocomial infections* indicate possible complications when the patient is diagnosed with another disease during a hospital stay. *Errors and incidents* indicate the quality of healthcare professionals and doctors. *Length of stay* is used to measure the number of days spent in hospital. Fewer days can increase the numbers of readmissions and higher numbers are more expensive. *Employee satisfaction with working conditions* is also important. Management theory considers employee satisfaction important because it affects the employees' performance, motivation, and approach to patients, which can be reflected in *patient satisfaction* with the provision of healthcare. Other factors, such as *use of modern equipment*, *waiting time*, and *mortality*, are not as important as the ones already mentioned. As mortality is the least important factor, the *hypothesis H2* is rejected.

On the basis of the values (r-c), it is possible to divide the factors into four groups. If the (r-c) value is positive, it is a factor that is causal and therefore affects other factors. The higher the value, the greater the influence the factor exerts on others. The following factors are the ones that are most affected by others F7 (1.315), F2 (1.209), and F11 (1.162).

In the case of a negative value (r-c), it is a factor that is influenced by others; it is a group effect. The lower the value, the more influenced the factor is within the group of selected factors. The factors that are most affected are: F1 (-2.95), F5 (-1.67), and F6 (-1.18). (*Figure 1.*)

The use of modern equipment, errors and incidents, and the ratio of capital expenditure to total cost are the key factors of successful hospital management in Slovakia. These factors can exert the greatest influence on other factors. If hospital management wants to improve the quality of healthcare, they must focus on these three factors. Modern equipment can provide better healthcare, as was suggested by the literature sources. Each year medicine is on a higher level because of new scientific knowledge. This knowledge is used to build modern equipment. Errors and incidents increase patient satisfaction and morale. As was mentioned before, expenditure is one of the most important factors. Thus, better financing of hospitals will increase the quality of healthcare.

As was mentioned in the description of the theory of the DEMATEL technique, factors can be divided into four quadrants:

− first quadrant (high degree of importance, important relationships): F2, F3, F4, F9, F10, and F11;
− second quadrant (little importance, high degree of relationships): F7;
− third quadrant (little importance, low degree of relationships): F5 and F8;
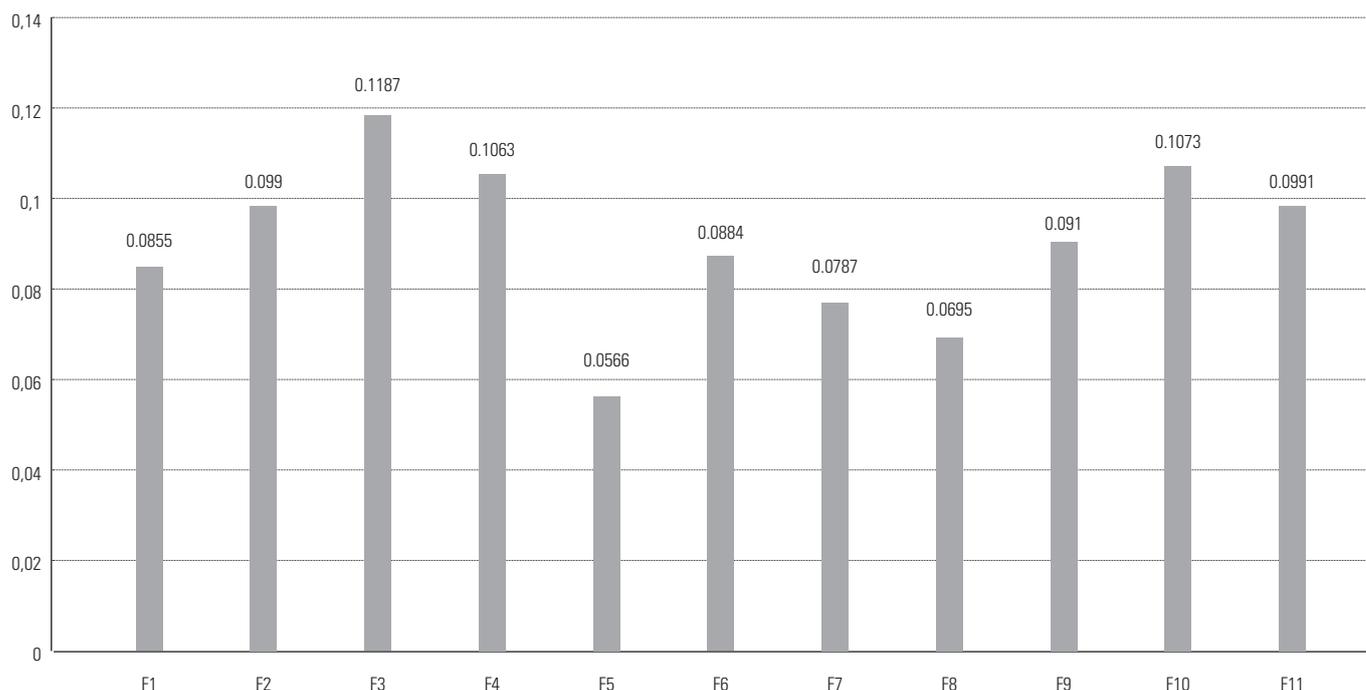− fourth quadrant (high degree of importance, low degree of relationships): F1 and F6.

Figure 1 | The weight of factors

According to the results of research we can say that patient satisfaction is most susceptible to the influence of other factors. Patients are very sensitive to the quality of healthcare and other factors, as was mentioned above, and also the mortality factor, which is routinely used in the WHO, OECD, and European Union classifications. This research shows us that in Slovakia too it is very important to measure this factor. A decreasing mortality rate indicates that healthcare is getting better. Employee satisfaction is a reflection of working conditions and the atmosphere in the workplace.

According to the literature review, patient satisfaction is a very important factor in measuring the quality of healthcare. This reflects not only quality in general, but also other factors such as errors and incidents, readmissions, waiting time, and length of stay. According to other research studies, a better quality of healthcare builds patients' satisfaction and loyalty (Fatima et al., 2018). If we compare this to our findings, we can confirm that patient satisfaction is an important indicator and it should be measured regularly in all hospitals in Slovakia.

We can use these general results in specialized hospitals, including those that deal with addictology, but we must take the different background into account. The results are generally applicable. Focusing on differences, we can add some new factors that consider the type of specialization.

● 4 CONCLUSION

In this article, a literature review that investigated professional national and foreign sources to find and compare different factors that are measured in healthcare or that can be significant in managing hospitals was conducted. The review also aimed to find similar and different views on healthcare. In the literature search, we find important factors of successful hospital management in Slovakia and defined two hypotheses, which formed the basis of our research.

After the literature review, research with eight experts was conducted to evaluate the weight of factors and groups of factors that exert the greatest influence on other factors and factors that are most influenced by other factors and are indicators of the quality of healthcare. This will help managers to find out which factors they can focus on, and which are not so important. We used the DEMATEL method to evaluate the data collected from experts from the field of healthcare management.

We found that the amount of money spent is the most important factor in Slovak hospitals in general, including all general and specialized hospitals. We also found that mortality is not an important factor, but it can be used to measure the quality of healthcare. On the basis of this research, we recommend managers to focus on financial management and to measure mortality as one of the important factors as feedback on their work.

As mentioned in the literature review, the performance of hospital management cannot be measured in the same way as that of business companies. There are many factors and many ways to measure it. Our findings can be used in hospital management in Slovakia to improve its quality and as support for managers. Managers can focus only on important factors, which is more effective.

This research was done in Slovakia. To use it in other countries, we would need to do it again, as in each country, there are different models of healthcare and the factors can be different. We focused only on important factors, so the results are only a basis, not a complete guide to hospital management. The experts were answering questions about hospitals generally, so there may be differences between private and state-owned hospitals, general and specialized ones, etc. For further research, we recommend doing research in other countries, or to compare private hospitals to state-owned ones. In specialized hospitals, we can use the results of the research to describe general factors and their influence, but we can add factors for new research respecting specializations. We expect that the results from specialized hospitals may bring partially different results. These research studies can bring new ideas for how to manage any type of hospital and will provide important tools for managers in healthcare.

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