

Service Quality Management at Lithuanian Healthcare Institutions

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Abstract

The principal purpose of the present paper is to examine the impact of service quality (SERVQUAL) dimensions on the satisfaction of service users' (patients' parents) with healthcare services and to develop a model of service quality management at healthcare institution. Measuring service quality dimensions is essential for achieving patient satisfaction with healthcare and for identification of weaknesses at healthcare institution. Research by authors at the largest Lithuanian Children's Hospital in Vilnius showed that strongest correlation relationships with satisfaction of patients' parents emerges with responsiveness and assurance dimensions, the weakest – empathy. Two dimensions of service quality (tangibles and responsiveness) generally explain the dispersion of satisfaction with healthcare services by 51.5%. Based on literature and research results, developed by authors model of service quality management at healthcare institution shows the essential four steps from planning to improvement, ensuring systematic improvement of service quality.

Keywords: healthcare service quality; satisfaction with service quality; SERVQUAL service quality dimensions; model of healthcare service quality management.

1. Introduction

The quality and management of the services provided by healthcare institutions is one of the priority goals in the improvement of healthcare both in Lithuania and other European and world countries. Public health is the greatest society value in the economic and social context. The needs and expectations of the people and society, especially in relation to high quality healthcare, are growing at great steps (Public audit..., 2007).

EuroHealth Consumer Index 2018 survey showed that Lithuanian residents are not satisfied with the quality of healthcare services (Lithuania ranked 28th out of 35 European countries, at 2017 year – 31st out of 34 countries). The scientific problem is that there is lack of indicators for measuring the quality of healthcare in Lithuania, accordingly it is impossible for consumers to objectively evaluate and choose healthcare services, which best meet their needs and help to better care for their health (Lithuanian law of 2017 No. XIII-903). Service providers must measure the quality of the services they provide in order to identify weaknesses and focus on improving the quality of service. Thus, the identification and measurement of service quality dimensions is essential for achieving patients satisfaction with health services and for the continued improvement of service (D'Cunha & Suresh, 2015).

The purpose of the present study is to assess the impact of service quality dimensions on the satisfaction of service users (patients' parents) with healthcare services and to develop a model of service quality management at healthcare institution.

Tasks of the study:

1. Measure expression of indicators of service quality dimensions and satisfaction with healthcare quality;

2. Examine the link between tangibles service quality dimension and satisfaction with healthcare quality;
3. Examine the link between reliability service quality dimension and satisfaction with healthcare quality;
4. Examine the link between responsiveness service quality dimension and satisfaction with healthcare quality;
5. Examine the link between assurance service quality dimension and satisfaction with healthcare quality;
6. Examine the link between empathy service quality dimension and satisfaction with healthcare quality;
7. Determine which of the five dimensions of the SERVQUAL method (tangibles, reliability, responsiveness, assurance or empathy) predicts service users satisfaction with healthcare services;
8. Based on the literature and study results, develop a model of service quality management at healthcare institution;
9. Formulate the key conclusions and provide insights into further research.

2. Literature review

Application of quality concept in healthcare. Allen–Duck *et al.* (2017) after reviewing numerous articles in the context of the quality concept for healthcare, formulated a definition of quality in healthcare, which describes quality in healthcare as – providing effective and safe healthcare based on a culture of excellence, which results in optimal desirable health condition. American Medical Association (1994) defined quality as 'a degree that indicates the likelihood that healthcare services will have an impact on optimal patient outcomes' (quotation from Allen–Duck *et al.*, 2017). USA National Academy of Medicine has provided this definition of quality in healthcare: the 'degree

by which health care for individuals and society increases the likelihood of obtaining the desired health condition using current professional knowledge' (Crossing the..., 2013). A little different perception of quality in healthcare is provided by World Health Organization (WHO), where quality is strategic decision making in health systems (Quality of..., 2006). Crosby (1984) described quality in health care as conformance to the requirements. Quality standard EN ISO 9000:2015 the term 'quality' describes as 'the degree to which a set of features of an object conform to the requirements'. WHO suggests focusing on improving the six dimensions (conditions) of the health system that characterize the quality of healthcare service: effective, efficient, accessible, acceptable/patient-centred, equitable, safe (Quality of..., 2006). Based on the clinical experience of healthcare institutions that are considered to provide good quality health care, EN ISO 9001:2015 standard for healthcare set eleven quality requirements for healthcare institutions: appropriate and correct care, availability, continuity of care, effectiveness, efficiency, equity, evidence/knowledge based care, patient centered care, patient involvement, patient safety, timeliness/ accessibility (Quality Management..., 2017).

Specifics of healthcare services at children's hospital. Healthcare at children's hospital requires a different strategy to improve the quality of services, as children's physiology, sociology, and psychology differs from adults, therefore, specific health care processes cannot normally be applied in a pediatric hospital based on practice with adults (Park, 2018). Communicating with a child is becoming an increasingly important aspect of the quality of service in child healthcare, which is often a challenge for the doctor (Damm *et al.*, 2015). Effective communication between parents, child and the healthcare professional can increase the accuracy of the diagnosis, improve patient understanding and compliance with the treatment process, and improve the quality and outcome of health services (Damm *et al.*, 2015).

Quality management methods and tools to improve the quality of healthcare services. Applying a variety of quality management tools – systems, models, and techniques in the public sector, such as healthcare, allows to ensure healthcare service quality (Kosinskienė & Ruževičius, 2010). Doctor Avedis Donabedian (1988) was the first who developed a model for improving quality in healthcare, that shows a close direct relationship between good structure and processes, also between good processes and good results gained during their interactions (Donabedian, 1988).

One of the organizational improvement measures and integral elements of the quality system is quality policy. Quality policy can be used to improve the performance of a healthcare institution, provided that it is in line with the strategy and vision of senior management regarding the future of the organization, formulated in a clear and comprehensible manner, including continuous improvement of identifying the needs and expectations of patients and other interested parties (Ruževičius, 2012).

There are key methods of evaluating the performance of a healthcare institution to determine whether an organization achieves its planned goals (Ruževičius, 2012):

- ❑ financial evaluation of activities;
- ❑ external measurements (e.g. benchmarking or third-party evaluation of the organization);
- ❑ process measurement in an organization;
- ❑ an assessment of the satisfaction of the users, employees and other interested parties with the quality of the organization work;
- ❑ assessment of other success factors defined by management.

Another method of external measurement activities for improving and evaluating quality involves audits of management systems, which are of three types: internal (first party) audits of the health care institution, customers (patients) quality man-

agement system (second party) audits and (third party) audits of an independent Quality Management System (QMS) certification institution on purpose to obtain a certificate of compliance (Serafinas, 2011).

Implementing a Quality Management System is a strategic decision of a healthcare institution that can improve the overall efficiency of an institution and lay a solid foundation for sustainable development initiatives (Quality Management..., 2017). An organization that has implemented a quality management model becomes managed as an integrated system with efficient processes leading to quality service delivery in healthcare (Ruževičius, 2012). Standard EN ISO 9001:2015 for healthcare is based on the following seven principles of quality: customer focus, leadership, engagement of people, process approach, improvement, evidence-based decision making and relationship management. A. Kosinskienė and J. Ruževičius (2011) noted that the implementation of QMS in countries, where quality management and QMS development at hospitals is financially promoted and defined by law, is more successful than in countries, where such principles are voluntary and advisory. One of the most popular methods of quality improvement and evaluation in Lithuania is self-evaluation according to the recognized international model – EFQM excellence model (Serafinas, 2011). The EFQM excellence model is based on eight key concepts of excellence that essentially describe characteristics of a perfect organizational culture: adding value for customers, creating a sustainable future, developing organisational capability, harnessing creativity and innovation, leading with vision, inspiration and integrity, managing with agility, succeeding through the talent of people, sustaining outstanding results (Domittner *et al.*, 2013). Favaretti *et al.* (2015) noted that the application of the EFQM excellence model in the Italian health care system resulted in a significant increase in self-evaluation and improved performance, especially in terms of customer satisfaction, staff and service delivery.

On the basis of the EFQM excellence model for improving the performance of public sector organizations, including hospitals, there was developed and adapted method of total quality management – Common Assessment Framework (CAF) (Kosinskienė & Ruževičius, 2011). CAF is based on the assumption that proper management of the organisation's operational processes and available organizational resources determines organizational performance results oriented to the public needs. This model provides an opportunity to evaluate the organization's performance simultaneously and on a variety of criteria (Common Assessment..., 2013).

Servqual model is a tool for evaluating the quality of services through various service characteristics, including both service perception and expectations. In order to help managers define goals and priorities for improvement and get the best results, the Servqual model can clear the gap between expectations and perception. One of measures of service quality is the level at which the services meet the needs or expectations of their customers (European consumer..., 2010).

3. Study methodology

For the study accomplishment satisfaction with healthcare services was selected by analysing service users' (patients' parents) evaluations in accordance with the dimensions of SERVQUAL model. Based on the scientific literature examined, the authors have developed a graphical model of the research concept (Fig.1).

Based on the developed graphic model of the research concept, the following **hypotheses** were raised:

- ❑ *First hypothesis 1 (H 1):* Tangibles quality dimension has a positive impact on service users' satisfaction with healthcare services.
- ❑ *Second hypothesis (H 2):* Reliability quality dimension

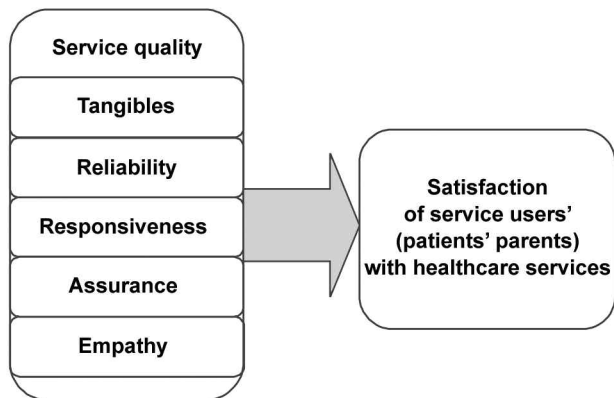


Figure 1. Graphic model of the research concept (compiled by the authors)

has a positive impact on service users' satisfaction with healthcare services.

- *Third hypothesis (H 3):* Responsiveness quality dimension has a positive impact on service users' satisfaction with healthcare services.
- *Fourth hypothesis (H 4):* Assurance quality dimension has a positive impact on service users' satisfaction with healthcare services.
- *Fifth hypothesis (H 5):* Empathy quality dimension has a positive impact on service users' satisfaction with healthcare services.

Sample. The object of the study was Children's Hospital service users' (patients' parents) satisfaction with the quality of healthcare services. According to the 2017 Children's Hospital performance report, the number of hospitalized patients (21,000) in 2017 at the Children's Hospital, on the basis of the sample size formula with 95 percent probability and the 8 percent probability of error, the resulting sample required for the study consisted of 149 service users (patients' parents). The minimal sample size consisting of the 149 respondents was surveyed. Surveyed respondents' sample represent the opinion of Children's Hospital service users in this regard.

Study methods. The data needed for the study were collected by publishing the questionnaire in the online program. Link to questionnaire was sent via social networks to facebook friends, acquaintances, facebook parents and kindergarten groups. Others were also asked to share a link with acquaintances who had visited Vilnius Children's Hospital of Santara Clinics (hereafter – Children's Hospital) with children under 18 years. Filling time of the questionnaire was unlimited. The sampling was based on both a spontaneous and random sampling strategy. The questionnaire consists of 4 parts: service quality construct: tangibles (4 statements); reliability (4 statements); responsiveness (4 statements); assurance (7 statements) and empathy (6 statements); satisfaction with healthcare services construct, an open question with suggestions and comments on how to improve the quality of services for the Children's Hospital, and demographic issues (gender, education and age of the child). Construct statements are measured on a five-point Likert scale (ranked: 1 - strongly disagree, 2 – disagree, 3 – neither agree nor disagree, 4 – agree, 5 – strongly agree). The questionnaire was developed according to SERVQUAL methodology for service quality assessment based on Parasuraman *et al.*, 1988; Poškutė & Bivainienė, 2011; European users..., 2010, 107 p.; Butt & Run, 2010; Rehaman & Husnain, 2018.

Questionnaire data were processed and analyzed using a statistical data analysis package *SPSS statistic 24.0*, Microsoft Excel. The internal consistency of the satisfaction with healthcare services construct and service quality dimensions constructs was assessed with Cronbach's α indicators. The

averages of the construct indicators were calculated, the correlation of the study variables was evaluated by the *Pearson* correlation coefficient, estimating correlation strength on the scale from 0 to 1 and from 0 to -1, i.e. if $r = 0$ – there is no dependency between the variables, the closer the value is -1 or 1, the dependency between the variables is stronger. Statistical differences between evaluations for the two independent samples analyzed (by gender, age of child) were assessed by *Student's t test*, for comparing three and more independent samples (by education) was used *ANOVA test*, according to the coefficients of significance: if $p \leq 0.05$, the differences between the indicators are considered statistically significant. The suitability of the data for the factor analysis was calculated by *Kaizer-Meyer-Olkin (KMO)*. Factor analysis was used to validate the constructs used, indicating that the five quality dimension scales (statements) fall into the same factors. Predictive factors for dependent variable – satisfaction with healthcare services – were assessed by applying *multidimensional linear regression*. In regression analysis the regression equation relates one variable Y , called a dependent variable, with independent variables X_1, X_2, \dots, X_K . In this study dependent variable Y – Satisfaction with healthcare services, independent variables: X_1 – Tangibles, X_2 – Reliability, X_3 – Responsiveness, X_4 – Assurance, X_5 – Empathy.

Demographic indicators. Respondents were asked about gender, their education and the age of their children. The questionnaire included possible answers.

Satisfaction with healthcare services construct consisted of the 4 following statements: 'I respond positively about Children's Hospital for other people', 'I would recommend Children's Hospital to my acquaintances and relatives', 'I intend to use the Children's Hospital healthcare services in the future as well', 'I give the Children's Hospital a preference under the necessity of healthcare services for my child'.

The Cronbach alpha score of the internal consistency of satisfaction construct is 0.86. The results of the factor analysis of the key components with a varimax rotation ($KMO = 0.78$, $Sig. < 0.05$) showed that the data were suitable for the analysis, and one factor was identified explaining 72.6 percent of the dispersion.

The Cronbach alpha score of the internal consistency of service quality 'Tangibles' dimension is 0.65. The results of the factor analysis of the key components with a varimax rotation ($KMO = 0.68$, $Sig. < 0.05$) showed that the data were suitable for the analysis, and one factor was identified explaining 50.67 percent of the dispersion.

The Cronbach alpha score of the internal consistency of service quality 'Reliability' dimension is 0.81. The results of the factor analysis of the key components with a varimax rotation ($KMO = 0.79$, $Sig. < 0.05$) showed that the data were suitable for the analysis, and one factor was identified explaining 65 percent of the dispersion.

The Cronbach alpha score of the internal consistency of service quality 'Responsiveness' dimension is 0.86. The results of the factor analysis of the key components with a varimax rotation ($KMO = 0.78$, $Sig. < 0.05$) showed that the data were suitable for the analysis, and one factor was identified explaining 70.44 percent of the dispersion.

The Cronbach alpha score of the internal consistency of service quality 'Assurance' dimension is 0.89. The results of the factor analysis of the key components with a varimax rotation ($KMO = 0.83$, $Sig. < 0.05$) showed that the data were suitable for the analysis, and one factor was identified explaining 61.37 percent of the dispersion.

The Cronbach alpha score of the internal consistency of service quality 'Empathy' dimension is 0.7. The results of the factor analysis of the key components with a varimax rotation ($KMO = 0.73$, $Sig. < 0.05$) showed that the data were suitable for the analysis, and one factor was identified explaining 40.16 percent of the dispersion.

4. Results

Majority of 149 surveyed patients parents are female (88.6 %). Most of respondents (73.8 %) have an university degree, 17.4 % have post-secondary education, 4.7 % – secondary education, and 4 % – vocational education. Most patients' parents replied that they have children under 4 years old (42.7 %), 4-7 year old children have 36.8 % of respondents, 8-11 year old children – 12.7 % of respondents, 12-15 year old children – 4.9 % and 16-18 year old children – 2.9 % of respondents.

The first task of the study was to measure the expression of indicators of five service quality dimensions and satisfaction with healthcare services. Research data showed that almost all criteria of five service quality dimensions ratings exceed the average 3 point out of 5 possible, with the exception of the empathy's dimension two criteria of less than 3 points out of 5 ('Parking at the hospital is convenient' – 2.30 point out of 5, 'Registration by telephone is convenient' – 2.93 point out of 5). Best rated (over 4 points out of 5) are two statements of tangibles dimension: 'Doctors' clothing is neat' (4.34 point out of 5) and 'The hospital premises are clean' (4.07 out of 5), also statement of assurance dimension: 'The hospital has qualified doctors' – 4.11 point out of 5. There is a statistically significant difference between respondents' responses to the empathy dimension statement by gender: 'Doctors give individual attention to the patient', which female rated better than male. Overall value of satisfaction with healthcare services – 3.97 point out of 5. The majority of respondents best agreed with the statement: 'I intend to use the Children's Hospital healthcare services in the future as well' – 4.12 point out of 5, and the least respondents agreed with statement 'I give the Children's Hospital a preference under the necessity of healthcare services for my child' – 3.77 point out of 5.

According to the data presented in Table 1, it is stated that averages of all five service quality dimensions are similar and exceed the average of 3 points.

Service quality dimension	Average	Standard deviation
Tangibles	3.87	0.57
Reliability	3.57	0.73
Responsiveness	3.67	0.74
Assurance	3.83	0.66
Empathy	3.38	0.64

Table 1. Averages and standard deviations of service quality dimensions (compiled by the authors on the basis of the study results)

Best averages scored dimensions of tangibles (3.87 out of 5) and assurance (3.83 out of 5). Empathy dimension scored the lowest average – 3.38 out of 5. Statistically, there is a difference in the assessment of the tangibles dimension depending on the age of children (16-18 aged childrens' parents rate it worse than other childrens' parents).

Link between service quality dimensions and satisfaction with healthcare

Pearson's correlation coefficients obtained between the service quality dimensions and satisfaction with health services (Table 2) have shown that there is a positive link between all dimensions of service quality and satisfaction. Strong link ($r > 0.7$) exists between reliability and responsiveness ($r = 0.797$, $p \leq 0.01$), reliability and assurance ($r = 0.815$, $p \leq 0.01$): the better aspects of reliability are rated, i.e. doctor's work (does not make mistakes, solves problems, provides services professionally and on time), the better will aspects of responsiveness be ranked (quick response to problems, willingness to help the patient, information about the treatment and its course, and quick service delivery) and aspects of assurance (staff helpfulness, respect, trust, sufficiency of the consultation time, doctors qualification, safe performance of service and intelligible explanation of treatment). The strongest link is between responsiveness and assurance ($r = 0.819$, $p \leq 0.01$).

Table 2. Correlation coefficients of service quality dimensions and satisfaction with healthcare services (compiled by the authors on the basis of the study results)

**** $p \leq 0.01$**

Service quality dimension	Tangibles	Reliability	Responsiveness	Assurance	Empathy
Satisfaction	0.603**	0.570**	0.670**	0.641**	0.483**
Tangibles	1	0.563**	0.592**	0.602**	0.481**
Reliability		1	0.797**	0.815**	0.515**
Responsiveness			1	0.819**	0.500**
Assurance				1	0.510**
Empathy					1

There is medium strength link between satisfaction with healthcare services and almost all service quality dimensions ($0.5 < r \leq 0.7$), except for the empathy dimension, which correlates weakly with satisfaction ($r < 0.5$).

Link between tangibles dimension and satisfaction with healthcare services

For the purpose of verifying the five hypotheses were calculated links between service quality dimensions and satisfaction with healthcare. According to data presented in Table 3, it is stated that while overall satisfaction with the dimension of tangibles correlates with average strength ($r = 0.603$, $p \leq 0.01$), however, with the separate tangibles criteria relationship of satisfaction is weak ($0.2 < r < 0.5$), except for statement about cleanliness of hospital premises, which correlates moderately with satisfaction ($r = 0.505$, $p \leq 0.01$).

Tangibles dimension's criteria	Satisfaction with healthcare services
The hospital uses modern equipment.	0.438**
Doctors' clothing is neat.	0.443**
The hospital premises are clean.	0.505**
The hospital premises are in clear position.	0.349**
Tangibles dimension in general	0.603**

**** $p \leq 0.01$**

Table 3. Correlation relationships between tangibles dimension's criteria and satisfaction with healthcare services (compiled by the authors on the basis of the study results)

The first hypothesis (H1) was confirmed: Tangibles quality dimension has a positive impact on service users' satisfaction with healthcare services.

Link between reliability dimension and satisfaction with healthcare services

According to Table 4 statistical values, it is emphasized that although reliability dimension generally moderately correlates with satisfaction ($r = 0.570$, $p \leq 0.01$), however, almost all reliability dimension criteria correlate weakly with satisfaction ($0.2 < r < 0.5$),

Reliability dimension's criteria	Satisfaction with healthcare services
Doctors do not make mistakes while providing the service.	0.421**
Hospital staff are willing to solve the problems.	0.519**
Services are provided on time.	0.419**
Services are done professionally.	0.498**
Reliability dimension in general	0.570**

**** $p \leq 0.01$**

Table 4. Correlation relationships between reliability dimension's criteria and satisfaction with healthcare services (compiled by the authors on the basis of the study results)

except for statement that 'Hospital staff are willing to solve the problems', which is related to the satisfaction of the moderate

correlation strength ($r=0.519$, $p\leq 0.01$). The second hypothesis (H2) was confirmed: Reliability quality dimension has a positive impact on service users' satisfaction with healthcare services.

Link between responsiveness dimension and satisfaction with healthcare services

With reference to Table 5 correlation coefficients, it is stated that with all the responsiveness dimension criteria the relationship with satisfaction is moderate ($0.5 < r \leq 0.7$). Most correlated with satisfaction is statement about *doctors ability to quickly provide the treatment* ($r=0.595$, $p\leq 0.01$) and *doctor's providing of information about the treatment and its course* ($r=0.588$, $p\leq 0.01$).

Responsiveness dimension's criteria	Satisfaction with healthcare services
Doctors are able to respond quickly to emerging problems.	0.551**
Doctors are willing to help patients when they need help.	0.515**
Doctors inform about the treatment and its course.	0.588**
Doctors are able to quickly provide the treatment.	0.595**
Responsiveness dimension in general	0.670**

** $p\leq 0.01$

Table 5. Correlation relationships between responsiveness dimension's criteria and satisfaction with healthcare services (compiled by the authors on the basis of the study results)

The third hypothesis (H3) was confirmed: Responsiveness quality dimension has a positive impact on service users' satisfaction with healthcare services.

Link between assurance dimension and satisfaction with healthcare services

Data in Table 6 show that although in general assurance dimension correlates with satisfaction by coefficient of moderate strength ($r=0.641$, $p\leq 0.01$), nevertheless, most of the criteria of assurance dimension correlate with satisfaction weakly ($0.2 < r \leq 0.5$).

Assurance dimension's criteria	Satisfaction with healthcare services
Hospital staff behave pleasantly and helpfully.	0.551**
Hospital staff behave with respect.	0.567**
I can trust in hospital doctors.	0.560**
Time spent with the doctor is sufficient.	0.434**
Doctors are able to explain intelligibly about treatment procedures.	0.475**
The hospital has qualified doctors.	0.436**
Doctors are able to perform services safely.	0.472**
Assurance dimension in general	0.641**

** $p\leq 0.01$

Table 6. Correlation relationships between assurance dimension's criteria and satisfaction with healthcare services (compiled by the authors on the basis of the study results)

The first three criteria of assurance dimension that describe the personal traits of the hospital staff are related to the satisfaction of the moderate strength relationship: *'Hospital staff behave with respect'* ($r=0.567$, $p\leq 0.01$), *'I can trust in hospital doctors'* ($r=0.560$, $p\leq 0.01$), *'Hospital staff behave pleasantly and helpfully'* ($r=0.551$, $p\leq 0.01$). According to correlation coefficients obtained can be inferred that the personal characteristics of hospital staff and doctors are more important for patients satisfaction (helpfulness, kindness, respect, trust) than time spent with the doctor, ability to explain intelligibly about the treatment, doctors qualification or safe service performance. The fourth hypothesis (H4) was confirmed: Assurance quality dimension has a positive impact on service users' satisfaction with healthcare services.

Link between empathy dimension and satisfaction with healthcare services

According to data presented in Table 7 it can be concluded that empathy dimension is generally weakly correlated with satisfaction ($r=0.483$, $p\leq 0.01$) and almost all of the empathy criteria have little effect on patient satisfaction with healthcare services ($0.2 < r \leq 0.5$).

Empathy dimension's criteria	Satisfaction with healthcare services
Doctors give individual attention to the patient.	0.464**
Registration by telephone is convenient.	0.276**
Registration by internet www.sergu. It is convenient.	0.196*
Reaching the hospital is convenient via public transport.	0.224**
Parking at the hospital is convenient.	0.307**
Hospital working hours are convenient.	0.411**
Empathy dimension in general	0.483**

** $p\leq 0.01$; * $p\leq 0.05$

Table 7. Correlation relationships between empathy dimension's criteria and satisfaction with healthcare services (compiled by the authors on the basis of the study results)

It should be noted that *registration by internet www.sergu.it* correlates very weakly (no connection) with satisfaction ($r=0.196$, $p\leq 0.05$). Despite the weak correlation coefficient values between these table variables, the fifth hypothesis (H5) was confirmed: Empathy quality dimension has a positive impact on service users' satisfaction with healthcare services.

Predicting factors of healthcare satisfaction

Multidimensional linear regression was used to check how separate dimensions of service quality predict satisfaction with healthcare. At linear regression analysis dependent variable – satisfaction with healthcare services, independent variables – tangibles, reliability, responsiveness, assurance and empathy. Determination coefficient R^2 value indicates how much the dependent variable – *satisfaction with healthcare services*, explains model that connects independent variables. The initial regression model was not suitable for analysis, whereas three variables (reliability, assurance and empathy dimensions) *t test* did not meet the requirements (their *p* value was higher than 0.05 significance level), therefore these three variables were discarded from the analysis and regression analysis has been repeated with two independent variables – tangibles and responsiveness. Multicollinearity VIF indicators obtained for the remaining two independent variables (tangibles and responsiveness dimensions) are less than 4, the statistical significance of the model is shown by $p=0.000$ and $F=77.519$ values, therefore the model is suitable for regression analysis. The results of regression analysis are presented in Table 8.

Independent variables	Dependent variable Satisfaction with healthcare services	
	Standardised β (Beta) coefficients of predicted variables	VIF
Tangibles	0.318**	1.540
Responsiveness	0.482**	1.540
Determination coefficient R^2	0.515	
F	77.519	

** $p\leq 0.01$

Table 8. Results of regressive analysis (compiled by the authors on the basis of the study results)

Based on regression analysis data, it is stated that both dimensions (tangibles and responsiveness) commonly explain 51.5% dispersion of satisfaction with healthcare services ($R^2 = 0.515$).

According to standardised β (Beta) coefficients values, it is

stated that variable *responsiveness* explains more of dependent variable *satisfaction with healthcare services* dispersion ($\beta=0.482$) than *tangibles* ($\beta=0.318$).

5. Model of service quality management at healthcare institution

Based on scientific literature analysis and authors' research results, using E. Deming continuous improvement cycle template consisting of four steps: *Planning – Performance – Evaluation – Improvement*, authors created a model of service quality management at healthcare institution (Fig. 2).

Since the standard EN ISO 9001:2015 for healthcare applies process approach, created model involves Plan – Do – Check – Act (PDCA) cycle. One of the organizational improvement measures is *quality policy*, corresponding the strategy and vision of senior management regarding the future of the organization, including continuous improvement in meeting the needs and expectations of patients and other interested parties, it is therefore important to plan implementing measures for quality policy (at *planning stage*). The process approach to health care determines the planning of the organization's clinical and other processes' interactions (*planning stage*), helps to analyze clinical processes, achieve effectiveness of clinical processes, improve processes based on data and evaluation of information.

At *Performance stage* consequential is implementation of quality policy and basic process at healthcare institution –

interaction of healthcare staff with the patient during clinical processes, which requires internal healthcare resources: relevant *infrastructure* (SERVQUAL tangibles dimension) and hospital staff (professional knowledge and culture of excellence). Culture of excellence (SERVQUAL assurance dimension) including collaboration, communication, competence, respect, responsibility and trust, in conclusion of the research has proved to be one of the most correlated ($r=0.641$, $p\leq 0.01$) with healthcare service satisfaction after responsiveness dimension ($r=0.670$, $p\leq 0.01$). Effective communication between parents, child and the healthcare professional can increase the accuracy of the diagnosis, improve patient understanding and compliance with the treatment process, and improve the quality and outcome of health services. On the other hand, it is highlighted the focus of healthcare on the *healthcare needs and expectations of the patient*, influenced by external factors (*healthcare initiatives*): promotion of healthy lifestyles, health protection, prevention of illnesses, improved access to medicines and ensuring of effective medicines (Input). The result (Output) achieves *the optimal desirable health condition* and *satisfaction with healthcare services*. During hospital staff interaction with patient (at *performance stage*) it is essential thing is *ensuring of healthcare conditions*: effectiveness, continuity of care, patient involvement in the treatment process and timeliness (SERVQUAL responsiveness dimension); efficiency, evidence/knowledge based care (SERVQUAL reliability dimension); availability, patient centered care (SERVQUAL empathy dimension); equity and security (SERVQUAL assurance dimension).

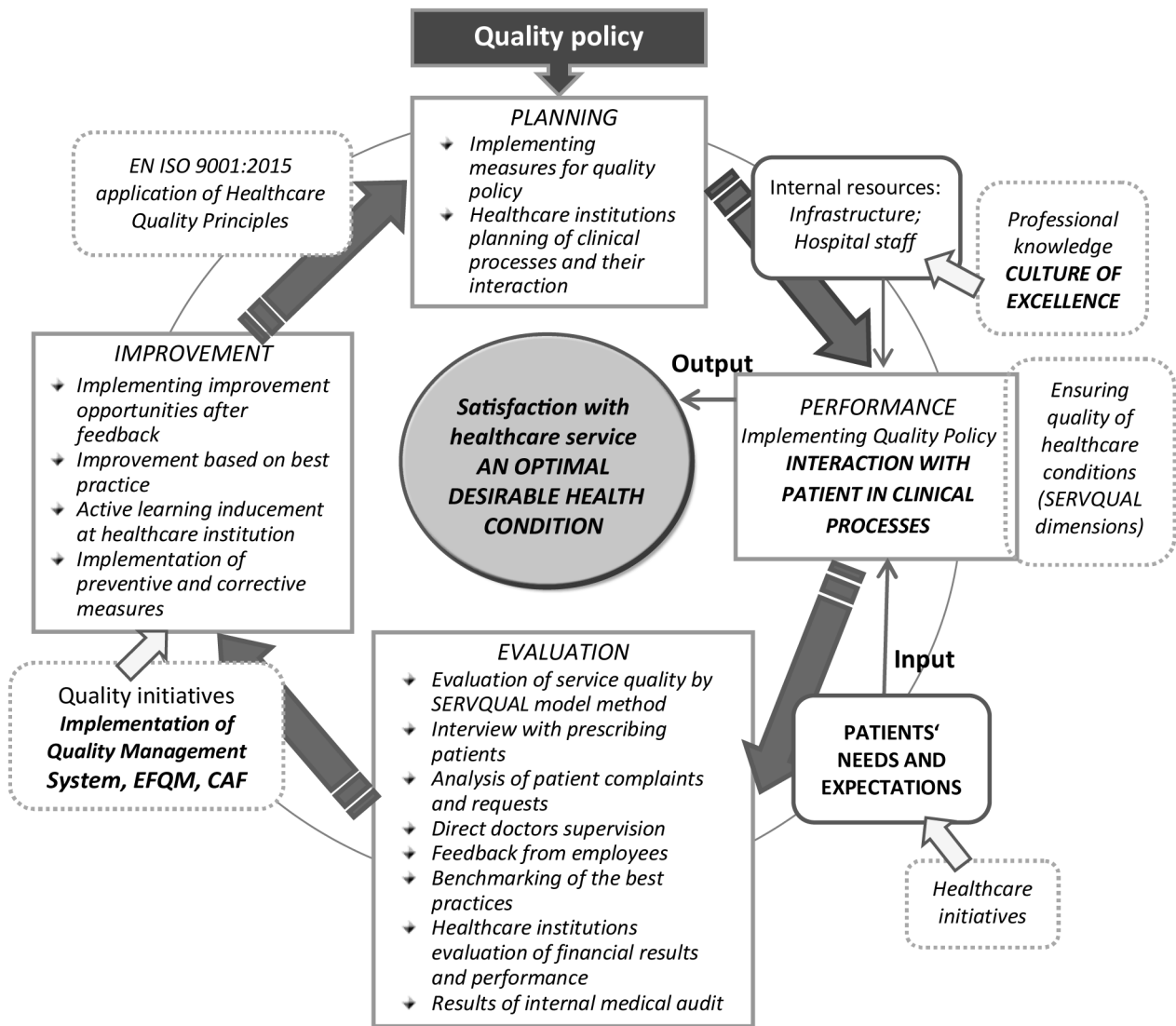


Figure 2. Model of service quality management at healthcare institution (compiled by authors based on the information from the research literature and the study results)

At the *evaluation stage*, it is important to analyze the quality of the actions taken during the performance stage, i.e. the quality of the hospital staff interaction with the patient process searching of the gaps and opportunities for development and moving to the fourth stage of *improvement*.

At *improvement stage* all opportunities for improvement and corrective and preventive measures are being implemented, as well as promotion of improvement and active learning. There are possible voluntary quality initiatives at healthcare institution: implementation of quality management system, EFQM excellence model or CAF. Application of Quality Management System EN ISO 9001:2015 standard for healthcare contributes to efficiency of processes, quality of services and satisfaction of all interested parties.

6. Conclusions

After examining the theoretical aspects of applying the concept of quality in health care, it emerged that quality health care services, as defined by the quality standard, WHO and other organizations and scientific articles, are described as: accessible, safe, effective, efficient, patient centered (needs and expectations), equitable, appropriate, evidence-based, timely and involving patient to the treatment process and decision making, accordingly can be grouped into five SERVQUAL quality dimensions.

Based on the calculated correlation coefficients between all variables, a strong relationship has been established between responsiveness and assurance, reliability and assurance, reliability and responsiveness dimensions.

After examining the links between five service quality di-

mensions and the satisfaction of patient's parents with the healthcare services, all five hypotheses have been confirmed. Responsiveness and assurance demonstrate the strongest correlation link with satisfaction, whereas the weakest – empathy.

Data of multidimensional regression analysis showed that two dimensions (tangibles and responsiveness) commonly explain 51.5% dispersion of satisfaction with healthcare services. Accordingly responsiveness (quick response to problems, willingness to help the patient, information about the treatment and its course and quick service performance) and tangibles (modern equipment, neat doctors clothing, clean hospital premises and their clear position) mostly predict patients' parents satisfaction with healthcare services.

Based on E. Deming continuous improvement cycle, developed by authors model of service quality management at healthcare institution shows the essential four steps from planning to improvement, ensuring systematic improvement of service quality. The model is applicable to all healthcare institutions: hospitals, sanatoriums, outpatient centers, rehabilitation centers, family doctor's offices, health care centers, etc.

Further possible insights for development of the problem: forasmuch authors explored attitude of healthcare service users towards service quality and satisfaction with service quality, it would be useful to examine attitude of service providers (healthcare specialists') towards service quality they provide and to identify problematic quality management points at healthcare institution. It would be also important to investigate an application of seven quality principles of EN ISO 9001:2015 quality standard (customer focus, leadership, engagement of people, process approach, improvement, evidence-based decision making and relationship management) at healthcare institution through a medical staff survey.

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