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THE DEVELOPMENT AND VALIDATION OF AN EVALUATION SYSTEM FOR PATIENTS' ASSESSMENT OF HEALTH SERVICES

Abstract

Background: In the service industry, perceived value is a concept of ever-increasing importance. It allows us to describe patients' perceptions of health services in a significantly more complex manner. To measure patients' perceptions of health services, we need a different measuring instrument, one that would take into account the multi-dimensional nature of perceived value. Purpose: the development and validation of a new instrument for measuring patient-reported outcomes after treatment. Methodology: the development of this instrument includes test construction, item reduction, validation, and the evaluation of its structure and internal consistency. Both exploratory and confirmatory factor analyses (EFA, CFA) were used. Results: The results of Cronbach's alpha for different constructs are: is 0.87 for Quality, 0.96 for Reputation, 0.83 for Perceived Value, 0.88 for Price, 0.89 for Satisfaction, and 0.90 for Loyalty. The values of other coefficients (Kaiser-Meyer-Olkin, Bartlett in explained variance) are also adequately high. The final absolute fit indices are: chi-square 426.3, df=137, RMSEA=0.05, NFI=0.96, CFI=0.98. Conclusion: our measuring instrument is characterized by high reliability and validity for measuring outcomes after treatment.

Keywords: perceived value, satisfaction, quality, loyalty, reputation, price, health services, measuring instrument

1.   INTRODUCTION

Healthcare activities also belong to fast-growing services. The rules that apply to other kinds of services also apply in the field of health services, although there are some important differences in comparison with other services. When patients evaluate hospital services, they take into account not only the benefits they received, but also the sacrifices they made to obtain those services (Teke et al., 2012). Based on the research into other service industries (Heinonen, 2004; Sanchez et al., 2006; Shamdasani et al., 2008; Sanchez, Fernandez et al., 2009; Pisnik & Snoj, 2010), we believe that in healthcare also the concept of perceived service value represents a basic construct (LeBlanc & Nguyen, 2001; Heinonen, 2004) that defines customers' (i.e., patients') comprehensive view of the service. For this reason, it is required a closer understanding of the concept of perceived service value, which represents one of the key and basic concepts not only in marketing (Heinonen, 2004; LeBlanc,2001), but also in the business of any organization in the market.

From studies of other service industries, we also know that the concept of perceived value is the richest central concept around which revolve both the benefits (such as, most frequently described, perceived quality and reputation) and the costs (in the form of prices, both monetary and non-monetary), as well as the most important effects of perceived value—the satisfaction with performed services and customer loyalty.

The understanding of these constructs may not only lead to greater customer satisfaction, but also enhance sustainable competitive advantages. While the relationship between service quality and customer satisfaction has been well explored in the past, perceived value has remained a comparatively neglected aspect of customers' experiences (Caruana, 2000; Petrick, 2002; Gallarza, 2013) especially in healthcare, where international experiences have meanwhile shown the rising importance of this concept for healthcare. To date, the efforts to measure patients' perceptions of health services have mostly focused on satisfaction and quality (Al Abri, 2014; Batbaatar, 2015; Wu 2017), as well as using a variety of Patient Satisfaction Questionnaires (PSQ). Our critique is aimed at their common characteristic of one-dimensional presentation of patients' perceptions and their disregard of certain important elements of perceived value. Most of the one-dimensional measurements stemmed from the SERVQUAL model (Parasuraman et al., 1988), which was criticized by other scholars (Haywood Farmer, 1988) for its non-applicability in service industries, especially in healthcare (Yesilada, 2010).

In the process of writing this paper, we could not find any multi-dimensional models of health service users' perceptions that would be entirely equal to our model. Since Choi et al. (2004), Moliner (2008), Wu (2011), and Örgev (2013) did not use a uniform questionnaire for their multi-dimensional models of the perceived value of health services, we decided to create an entirely new measuring instrument for our model.

Our purpose is to present the development of this measuring instrument – a questionnaire for measuring the perceived value of health services as a multi-dimensional constuct.

2.   THEORETICAL DESCRIPTION OF MODEL BASICS AND OPERATIONALISATION

2.1.   Perceived value

Zeithamel's definition (1988) says that the perceived value is a ratio between what you get and what you have to sacrifice in order to obtain it. This description gives a simple one-dimensional meaning to the concept of perceived value. When evaluating their own experiences with healthcare providers, not only do the patients define the received benefits, but also the sacrifices they made in order to get the service. When they can, patients choose those providers of healthcare services whom they perceive as valued (Pan, 2011).

Many researchers (Qian et al., 2011; Cegiz & Kirkbir, 2007; Zifko-Baliga & Krampr, 1997) think that a patient's perceived value is an overall evaluation of some healthcare service, based on one's perception of what was obtained and what was invested in order to receive that service.

Choi, Cho, Lee, Lee and Kim (2004), and Ekrem and Fazil (2007) warn about the little attention paid to the operationalisation of perceived value in the area of healthcare services. At the same time, Chahal and Kumari (2012) point out that we should not entirely equate the dimensions of perceived value in healthcare services with other service activities.

2.2.   Healthcare service quality

Healthcare service quality is defined as a gap between patients' expectations and perceptions about the service (Woodside, 1989). Patient expectations refer to the patient's opinion about how a certain healthcare service should be performed, and patient perceptions refer to how the patient perceives the service. Parasuraman, Zeithaml and Berry (1988) chose 22 variables in order to describe five different dimensions of quality. Their measuring scale consists of 44 questions (22 for expected quality and 22 for perceived quality). Respondents' answers were measured using a 7-point Likert scale. The greater the difference (a more positive result) between the perceived and expected value, the higher the service quality.

Nowadays, a SERVQUAL model is the most widely accepted method for measuring service quality. The purpose of this method is to measure consumer expectations about certain types of services and consumer perceptions about the service rendered by some provider of a specific service. It measures the quality of services according to consumer perceptions, i.e., it is a scale that measures the gap between the expected and the perceived service with regard to the five

dimensions of quality. Those are reliability, physical evidence, responsiveness, guarantee and empathy (Cirinski, 2008).

2.3.   Reputation

Due to a lack of information that would be helpful to patients when choosing a healthcare provider, this decision often depends on the reputation of healthcare providers (Dijs-Eslinga et al., 2010). Patients' experiences also affect the reputation of healthcare institutions. Patients with more experience have less trouble with evaluating healthcare providers. Satir (2006) also advises to measure the reputation of healthcare institutions according to patients' perceptions. An important article in the Healthcare Collector (2006) states that 75 percent of patients use reputation as a primary criterion for their choice. When it comes to elective (or scheduled) treatments in a specialised healthcare institution, reputation is certainly the most important psychological factor that affects a patient's decision about the institution in which the treatment will be administered. Many times the reputation of such an institution is associated merely with the reputation of a single individual. In the case of specialised institutions, patients try to identify a doctor that enjoys the highest reputation among those persons whose opinions they solicited (and information travels by word of mouth). In the research of Choi, Cho, Lee, Lee and Kim (2004) the following items were used for the operationalisation of hospital reputation:

- In your opinion, the hospital has a positive reputation.
- The hospital offers social activities.
- The hospital is sincere with its patients.
- The hospital has pleasant surroundings.
- The hospital is quiet and peaceful.
- The hospital has a considerable reputation for quality.

Chahal and Bala (2012) used the following items for the operationalisation of hospital reputation:

- In your opinion, the institution has a positive reputation.
- The institution offers social activities.
- The institution is sincere with its patients.

2.4.   Healthcare service price

In the marketing literature, customer sacrifice generally refers to customers' joint costs of obtaining a product or a service. Patient sacrifice therefore refers to the overall sacrifice or joint cost of a healthcare service, i.e., the sacrifices patients make in order to gain some healthcare service. There are few studies that deal with the aspect of sacrifice in the area of healthcare services. The time spent in waiting for a service, the so-called waiting period, is certainly an important, if not the most important factor in healthcare.

Other authors, such as Sloan (1978), added a few other elements to the non-monetary price of healthcare services, e.g., the simplicity of access and waiting time in the context of a queue (Parker & Srinivasan, 1976). Psychological price factors, such as patients' fears and worries, and treatment upon admission (Thieman, 1985; Connors, 1987) were added later to the above mentioned price factors. After all, it is impossible to omit the psychological aspect because, clearly, when the patient has to be hospitalized, even if just for one night, this psychological moment factors into the price or sacrifice. Cronin, Brady, and Hult (2000) used the following items for the operationalisation of the healthcare service price:

- The price that I pay for the healthcare service.
- The time needed for this healthcare service.
- The effort that I have to put in.

2.5. Patient satisfaction

In the context of shopping, Oliver (1999) defined satisfaction as a psychological phenomenon which is a consequence of expectations based on emotions and shopping experiences. In healthcare also, the concept of patient satisfaction is a critical indicator. Providers of healthcare services must understand patients' expectations and they certainly must try to meet those expectations (Lee et al., 2010). But satisfied patients are important for healthcare providers too because such patients tend to obey all instructions of the medical personnel and build up the good reputation of their medical institution. At the same time, they are more loyal to an institution with which they are satisfied (Hekkert et al., 2009). Choi, Cho, Lee, Lee and Kim (2004) use the following two questions for the operationalisation of patient satisfaction with healthcare services:

- How satisfied are you with the service you received in the hospital?
- How satisfied are you with your decision to come to this hospital?

Marschall and Hays (1994) published a so-called short form questionnaire about patient satisfaction (Patient Satisfaction Questionnaire Short Form; PSQ-18). They understand patient satisfaction as a multi-dimensional construct, widened by including such dimensions as quality and price. In the part of the questionnaire concerning satisfaction (as other authors understand it and as we define it in the doctoral thesis), they use the following two items:

- I was dissatisfied with numerous aspects of my medical treatment.
- The healthcare service was excellent.

Örgev and Bekar (2013) measure the following items regarding patient satisfaction with healthcare services:

- I am satisfied with the healthcare service.
- My expectations were fulfilled.

- My level of satisfaction is higher in comparison with other hospitals.

Wu (2011) measures the following items regarding patient satisfaction:

- My satisfaction with the healthcare service was high.
- Satisfaction influences my decision about further visits.
- I am satisfied with the benefits I received.

Zarei, Dasneshkohan, Pouragha, Marzban and Arab (2015) used the following items regarding patient satisfaction with private healthcare institutions:
- general satisfaction with the services rendered
- satisfaction with choosing a specific hospital
- positive feelings about relations with the hospital's personnel
- satisfaction with the decision to be hospitalised in a specific hospital.

2.6.   Patient loyalty

Oliver (1999) defines customer loyalty as a commitment to repeat the purchase or to use a product regularly in the future: due to loyalty, repeated purchases or uses of the same brand actually happen. Loyalty represents an intention to repeat one's purchases in the future. In the patient-provider relationship of healthcare services, we speak about emotional trust, which is different than functional trust. The studies of patient loyalty (i.e., predictions about patients' repeat visits) are important for planning the capacity of healthcare facilities. Furthermore, analyses of patient loyalty significantly contribute to quality enhancement and help reveal potential weaknesses in a treatment process (Lackland et al., 2001). Chahal and Bala (2012) use the following items for the operationalisation of patient loyalty in healthcare institutions:

- This institution is my first choice.
- I and those close to me generally visit this institution.
- I will recommend this institution to my relatives and friends.
- I will recommend this institution to everybody.
- I have a positive attitude towards this institution.
- I and those close to me will visit this institution again in case of recurring illness.
- I and those close to me will visit this institution again in case of other illnesses.
- I intend to change my healthcare institution in future.

Choi, Cho, Lee, Lee and Kim (2004) use the following items for the operationalization of patient loyalty:

- This hospital has always been my first choice.
- I and my family generally visit this hospital;
- I would recommend this hospital to others.
- I have a positive attitude towards this hospital.

- I and my relatives choose this hospital in case of recurring illness.
- I am going to choose another hospital in the future.
- I and my relatives choose this hospital in case of other illnesses.

Figure 1 shows our conceptual model of perceived value in health services, along with the constructs described above.

3.   METHODOLOGY

After reviewing the existing individual evaluation systems, we designed the first questionnaire (Table 1). This questionnaire was tested on 200 patients admitted to the department of surgery for treatment, who were over 18 and cognitively completely healthy. The questionnaire was given after treatment by the same medical person, after explanation provided to patients. Likert – type scale of five points was used to the latent constructs considered in this study (1="strongly disagree" and 5="strongly agree"). First, we checked the coefficients of kurtosis and asymmetry. Where the coefficients were higher than plus 1 or lower than minus 1, the variables were transformed by squaring. The variables that did not fit the conditions mentioned above were eliminated.

For reliability, we used an exploratory factor analysis (EFA) and Cronbach's alpha. In all the factor analyses, the assumptions pertinent to this method were assessed and in all cases the final factor analyses met the criteria enumerated below (Malholtra, 2004):

- The Kaiser-Meyer-Olkin (KMO) measure of ratio adequacy between the number of variables and the size of the sample shows an adequate result, i.e., higher than 0.5.
- The Bartlett's test of sphericity shows an association between variables that is statistically significant, with a risk level of less than 5% (sig.<=0.05).
- All the commonalities of the variables included in the final factor analyses are adequate, i.e., higher than 0.40.
- All the variables included in the final model did not correlate with multiple factors, i.e. the factor weights (abs.) of one factor are higher than 0.40, and the weights (abs.) of other factors (when there are more of them) were lower than 0.40 (not relevant).

Unlike CFA, EFA does not explicitly test unidimensionality (Gerbing & Anderson, 1988), which means it has to be followed by CFA. Furthermore, CFA makes it possible to estimate the reliability of the constructs of a measuring instrument, based on the value of R^2 (Diamantopoulus & Siguaw, 2000).

In addition, CFA is also used for estimating the discriminant validity of constructs, which can be estimated in the following two ways:
1. by using the Fornell-Larcker criterion (Fornell & Larcker, 1981) and
2. by using the Chi-square difference test (Joreskog & Sörbom, 1971; Gerbing & Anderson, 1988).

Based on the results of statistical analysis (Table 2) we then designed the second questionnaire (Table 3).

The second questionnaire was tested on 800 patients the same way as the pilot study. Likert – type scale of seven points was used to the latent constructs considered in this study (1="strongly disagree" and 7="strongly agree"). Again, we used the same methods as with the first questionnaire:

- checking kurtosis and asymmetry
- EFA and Cronbach's alpha
- CFA by using the Fornell-Larcker criterion and the Chi-square difference test.

For complete data processing, SPSS statistical package and corresponding AMOS software were used, together with LISREL software package, depending on the available software at the time when the study was conducted.

4.   RESULTS

Table 4 shows the values of Cronbach's alpha, the explained variance, Kaiser-Meyer-Olkin's measure of adequacy, and the statistical values of Bartlett's test for all constructs. The initial CFA model is shown in Figure 2. This model does not fit the data well enough. RMSEA shows how well a model with optimally chosen parameters would fit the population covariance matrix. Its desirable value is less than 0.06. In the case of the model shown in Figure 2, this value equals 0.07. With NFI, we look at chi-square derivation. Its desirable value should be 0.95 or more. The model in Figure 2 has an NFI of 0.92. CFI is an indicator that compares the current and the null model. It should be 0.95 or more. In the presented model, NFI equals 0.93. GFI compares the covariance of parameters according to causal covariance. It is desirable that it be more than 0.90. The model in Figure 2 has a GFI of 0.87.

Due to inadequate statistical adjustments, we eliminated some variables and got the final CFA model (Figure 3). The final absolute fit indices are: chi-square 426.3, df=137, RMSEA=0.05, NFI=0.96, CFI=0.98. Then we made CFA for all our constructs. The purpose of this analyses is to verify the chosen global fit indices of individual constructs, to verify the statistical significance of the weights of the manifest variables (sig. ≤ 0.05), and to verify the construct's reliability, i.e., its internal consistency, which can be determined on the basis of high R^2 values (Diamantopoulos & Siguaw, 2000). In addition, the discriminant validity of individual constructs was further tested in a two-stage process by using the chi-square difference test for the nested models of all pairs of constructs (Joreskog, 1971; summarized by Gerbing & Anderson, 1988).

Table 6 shows the final questionnaire.

5.   DISCUSSION

Over the last decade, increased attention has been given to measuring and improving patient experiences in healthcare (La Vela, 2014). Our study shows the development of a new evaluation system – the evaluation of healthcare services from a patient's point of view. So far, there have been different studies of perceived value, which is one of the most important contemporary marketing concepts. Based on these studies, we may deduce that the concept of perceived value can also be used to define healthcare services. We believe that the perceived value of a particular health service is determined by a ratio between its benefits and sacrifices, whereby quality, reputation, satisfaction, and loyalty represent the benefits, while the monetary and non-monetary components of price represent the sacrifices. Thus far, the descriptions of patient experiences have been based on measuring patient satisfaction and service quality. But based on the research in other fields, it is obvious that the concept of perceived value is much fuller and richer. Since we have conceived of patient perception as a multi-dimensional construct, it is clear that the old one-dimensional instruments do not apply and that we would have to create a new questionnaire. We created our first evaluation system by the operationalization of the basic elements of perceived value. After the pilot testing, we significantly reduced the number of questions. Not only did we use the basic statistical methods, but also the exploratory and confirmatory factor analyses. In this manner, we ensured a very strong statistical validity. The Cronbach's coefficient for the construct of price was too low (0.40), which revealed its low reliability. Therefore, we included additional questions in the second questionnaire. We did not have such problems with the other constructs. Since EFA, unlike CFA, does not provide the explicit testing of unidimensionality, we also performed CFA at the end. We used the Fornell-Larcker criterion (Fornell & Larcker, 1981) and the Chi-square difference test. By further eliminating the variables, we achieved a better discriminatory validity for all constructs, according to the Fornell-Larcker criterion. By using CFA, we tested the entire model and each construct of the optimised measuring instrument as well.

We then tested this evaluation system on 800 patients, refined it again, and tested it as described in the previous paragraph. Thus, we got the final questionnaire, which has excellent statistical indicators, and is both short enough and easy to use.

The first questionnaire consisted of 53 questions. After the elimination, we ended up with a questionnaire that had 19 questions and covered all six categories that we considered to be significant for the evaluation of healthcare services (quality, reputation, price, perceived value, satisfaction, loyalty). Regarding the final adequacy of the questionnaire, we believe that all chosen constructs in the questionnaire are adequate and that, by using them, we reliably present customers' (patients') perceptions of their healthcare services within the aspects of content and statistics. Since we have not found identical conceptual models in the available literature about the perceived value of healthcare services,

any comparison with other similar studies is rather difficult. Choi et al. (2004) used a questionnaire that consisted of 36 questions which determined perceived value, quality, loyalty, and reputation. Wu (2011) defined the concept of perceived value as quality, reputation, loyalty, and patient satisfaction. He did not develop a measuring scale. Teke et al. (2012) designed a questionnaire with 21 questions in which he defined perceived value as a functional value (installations, professionalism, quality), a social value, and an emotional value. Örgev and Bekar (2013), Moliner (2008) used a slightly modified Gloval scale (Sanchez et al., 2006) by which the associations between the non-monetary price, perceived value, and patient satisfaction were determined. Gloval scale does not take in account non monetary price and a risks, so he added SERPERVAL(Petrick, 2002) scale.

In a public hospital is the nonmonetary price very important, becuase the patient does know the real monetary price of the service. He can only feel the non monetary price.

Also, our study was conducted on an enviably large sample of 200 patients in the pilot study and 800 patients in the final study. None of the above-mentioned studies were conducted on such a large sample.

There remain several limitations to our findings. The questionnaire was tested in only two hospitals. Although we expected a generalized score, the validity in other settings has not yet been established. The score was tested only on surgical patients. Whether the score is effective in other fields of medicine remains uncertain.

We believe that it would be reasonable to use this questionnaire as frequently as possible in different areas of the healthcare system, different levels of treatment, and different healthcare systems. As an additional benefit, the management of a healthcare institution gets a tool for monitoring customer perspectives and for measuring potential improvements in service performance.

REFERENCES

Al-Abri, R.; Al-Balushi, A. (2014). Patient Satisfaction Survey as a Tool Towards Quality Improvement. *Oman Medical Journal*, Vol. 29, No. 1, pp. 3-7.

Batbaatar, E.; Dorjdagva, J.; Luvsannyam, A.; Amenta, P. (2015). Conceptualisation of patient satisfaction: a systematic narrative literature review. *Perspect Public Health*, Vol. 135, No. 5, pp. 243-250.

Caruana, A.; Money, A. H.; Berthon, P. R. (2000). Service quality and satisfaction – the moderating role of value. *Eur J Marketing*, Vol. 34, pp. 1338-1352.

Cengiz, E.; Kirkir, F. (2007). Customer perceived value: the development of a multiple item scale in hospitals. *Problems and perspectives in management*, Vol. 5, No. 3, pp. 252-267.

Chahal, H.; Bala, M. (2012). Significant components of service brand equity in healthcare sector. *International Journal of Health Care*, Vol. 25, No. 4, pp. 343-362.

Choi, K.; Cho, W.; Lee, S.; Lee, H.; Kim, C. (2004). The relationship among quality, value, satisfaction and behavioral intention in healthcare provider choice: a South Korean study. *Journal of Business Research*, Vol. 57, pp. 913-921.

Cirinski, S. (2008). *Vloga tržnega komuniciranja pri oblikovanju pričakovanj o kakovosti storitev v termah Čatež, d. d.* Diplomsko delo. Ljubljana: Fakulteta za družbene vede.

Connors, E. J. (1987). Providers and Quality Assessment: We must get our act together now. *American Hospital Associatteion News*, Vol. 23, No. 23, p. 4.

Cronin, J. J.; Brady, M. K.; Hult, G. T. (2000). Assessing the effects of quality, value, and customer satisfaction on consumer beahvioral intentions in service environments. *Journal of Retailing*, Vol. 76, pp. 193-218.

Diamantopoulos, A.; Siguaw, J. A. (2000). *Introducing LISREL.* London, England: SAGE Publications, Ltd.

Dijs-Elsniga, J.; Otten, W.; Verluijs, M. M. et al. (2010). Choosing a hospital for surgery: the importance of information on quality of care. *Med Decis Making*, Vol. 30, pp. 544-555.

Ekrem, C.; Fazil, K. (2007). Costumer perceived value: the development of a multiple item scale in hospitals. *Problems and Perspectives in Management*, Vol. 5, No. 3, pp. 252-268.

Fornell, C.; Larcker, D. F. (1981). Evaluating structural equation models with unobservervable variables and measurement error. *Journal of Marketing Reasearch*, Vol. 18, No. 1, pp. 39-50.

Gallarza, M. G.; Saura, I. G.; Moreno, F. A. (2013). The quality-value-satisfaction-loyalty chain: relationships and impacts. *Tourism Review*, Vol. 68, pp. 3-20.

Gerbing, D. W.; Anderson, J. C. (1988). An Updated Paradigm for Scale Development Incorporating Unidimensionality and its Assensment. *Journal of Marketing Research*, Vol. 25, pp. 186-192.

Haywood Farmer, J.; Stuart, F. (1988). *Measuring the quality of professional services. The Management of service operations, procedings of the*

third annual international conference of the uk operations management association. R. Johnston, Ed. London: University of Warwick.

Healthcare Collector (2006). *Patient perception of reputation is key*, Iss. Feb, pp. 5-6.

Heinonen, K. (2004). Reconceptualizing customer perceived value: the value of time and place. *Managing Service Quality*, Vol. 14, pp. 205-215.

Hekkert, K. D.; Cihangir, S.; Kleefstra, S. M.; Van der Berg, B.; Kool, R. B. (2009). Patient satisfaction revisited: a multilevel approach. *Social Science & Medicine*, Vol. 69, pp. 68-75.

Jöreskog, K. G.; Sörbom, D. (1993). *Structural Equation Modeling with the SIMPLIS Command Language.* Upsala University.

Lackland, D.; Silvestein, M.; Zoller, J. (2001). Predicting patient intent to return from satisfaction scores. *Journal of Ambulatory Care Manegement*, Vol. 24, pp. 44-50.

LaVela, S. L.; Gallan, A. (2014). Evaluation and measurement of patient experience. *Patient Experience Journal*, Vol. 1, pp. 28-36.

LeBlanc, G.; Nguyen, N. (2001). An exploratory study on the cues that signal value to members in retail cooperatives. *International Journal of Retail&Distribution Management*, Vol. 29, No. 1, pp. 49-59.

Lee, W. I.; Chen, C. W.; Chen, T. H.; Chen, C. Y. (2010). The relationship between consumer orientation, service value, medical care service quality and patient satisfaction: The case of a medical center in Southern Taiwan. *Afr. J. Bus. Manage*,Vol. 4, No. 4, pp. 448-458.

Malholtra, N. K.(2004). *Marketing research: methodological foundations (4th edition).* Ohio: South-Western/Thomson Learning, Mason.

Marschall, G. N.; Hays, R. D. (1994). *The Patient Satisfaction Questionnaire Short Form (PSQ-18)*. Santa Monica, CA: RAND Corporation.

Moliner, M. A. (2008). Loyalty, perceived value and relationship quality in healthcare services. *Journal of Service Management*, Vol. 20, No. 1, pp. 76-97.

Oliver, R. (1999). Whence customer loyalty?. *Journal of Marketing*, Vol. 63, No. 3, pp. 33-44.

Örgev, C.; Bekar, T. (2013). Non-Monetary costs, Hospital perceived value and patient satisfaction in health institutions. *International Journal of Alanya Faculty of Business*, Vol. 5, No. 2, pp. 87-97.

Pan, F. C. (2011). Perceived values on hospital services: A fuzzy logic application. *African journal of business management*, Vol. 5, No. 11, pp. 4465-4475.

Parasuraman, A.; Zeithaml, V. A.; Berry, L. L. (1988). SERVQUAL: A multiple Item Scale for measuring consumer perceptions of Service Quality. *Journal of Retailing*, Vol. 64, No. 1, pp. 12-40.

Parker, B. R.; Srinivasan, V. (1976). Consumer preference approach to the planning of rural primary healthcare facilities. *Operations Research*, Vol. 24, pp. 991-1025.

Petrick, J. F. (2002). Development of multi-dimensional scale for measuring the perceived value of a service. *J Leisure Res*, Vol. 34, pp. 119-134.

Petrick, J. F. (2002). Development of a Multi-Dimensional Scale for Measuring the perceived value of a service. *Journal of Leisure Research*, Vol. 34, No. 2, pp. 119-134.

Pevec, T.; Pisnik, A. (2016). Perceived Value Of Health Service – The Conceptual Model. *China – Usa Business Review*, Vol. 15, No. 2, pp. 80-88.

Pisnik Korda, A.; Snoj, B. (2010). Development, validity and reliability of perceived service quality in retail banking and its relationship with perceived value and customer satisfaction. *Managing Global Transitions*, Vol. 8, No. 2, pp. 187-205. Available from: http://www.fm-kp.si/zalozba/ISSN/1581-6311/8_187-205.pdf

Qian, H.; Li, G. B.; Chen, H.; Zhang, D. L. (2004). An exploratory research of patient perceived value in China. *Journal of medical marketing: Device, Diagnostic and Pharmaceutical Marketing*, Vol. 11, No. 4, pp. 277-283.

Sanchez, J.; Callarisa, L.; Rodriguez, R. T.; Moliner, M. (2006). Perveived value of the purchase of a tourism product. *Tourism Management*, Vol. 27, No. 3, pp. 394-409.

Sanchez-Fernandez, R.; Iniesta-Bonillo, M. A.; Holbrook, M. B. (2009). The conceptualization and measurement of customer value in services. *International Journal of Market Research*, Vol. 51, No. 1, pp. 93-113.

Satir, C. (2006). The nature of corporate reputation and the measurement of reputation components: An empirical study within a hospital. Corporate Communications. *An International Journal*, Vol. 11, No. 1, pp. 56-63.

Shamdasani, P.; Mukherjee, A.; Malhotra, N. (2008). Antecedents and consequences of service quality in consumer evaluation of self-service Internet technologies. *The Service Industries Journal*, Vol. 28, No. 1, pp. 117-138.

Sloan, F. A. (1978). Demand for physicians Services in alternatve practice settings: A multiple logit analysis. *Quarterly review of economics and business*, Vol. 18, pp. 41-61.

Teke, A.; Cengiz, E.; Cetin, M.; Demir, C.; Kirkbir, F.; Fedei, T. (2012). Analysis of the Multi-Item Dimensionality of Patients,s Perceived Value in Hospital Services. *J Med Syst*, Vol. 36, pp. 1301-1307.

Thieman, E. A. (1985). Marketing in not new to many physicians and dentists. *Journal of health care marketing*, Vol. 5, No. 3, pp. 5-6.

Woo, B. F. Y.; Lee, J. X. Y.; Tam, W. W. S. (2017). The impact of the advanced practice nursing role on quality of care, clinical outcomes, patient satisfaction, and cost in the emergency and critical care settings: a systematic review. *Hum Resour Health*, Vol. 15, No. 1, p. 63.

Woodside, A. G.; Frey, L. L.; Daly, R. T. (1989). Linking service quality, customer satisfaction, and behavioural intention. *Journal of Healthcare Marketing*, Vol. 9, No. 4, pp. 5-17.

Wu, C. C. (2011). The impact of hospital brand image on service quality, patient satisfaction and loyalty. *African Journal of Business Management*, Vol. 5, No. 12, pp. 4873-4882.

Yesilada, F.; Direktor, E. (2010). Health Care Service Quality: A Comparison of public and private hospitals. *African Journal of Businee management*, Vol. 4, No. 6, pp. 962-971.

Zarei, E.; Dasneshkohan, A.; Pouragha, B.; Marzban, S.; Arab, M. (2015). An empirical study of the impact of service quality on patient satifaction in private hospitals, Iran. *Global Journal of Health Science*, Vol. 7, No. 1, pp. 1-7.

Zeithaml, V. A. (1988). Consumer perception of price, quality and value: a means-end-model and synthesis of evidence. *Journal of Marketing*, Vol. 52, pp. 2-22.

Zifko-Baliga, G. M.; Krampr, R. R. (1997). Managing perceptions of hospital quality. *Market Health Serv*, pp. 29-35.

APPENDICES

<div align="right">Table 1</div>

An initial questionnaire

Dear patients,

We kindly ask you to fill in the questionnaire regarding your expectations and satisfaction in consideration with a treatment in this institution. Only with the help of your answers we will be able to improve our work at the department.

We tried to form the questionnaire to take you as little time as possible.

There are available individual statements which you have to evaluate on a scale from 1 to 5, whereas the evaluation 1 means, that you absolutely do not agree with the statement, and the evaluation 5 means that you completely agree with the statement.

We are very grateful for your time and effort!

In the first part we are interested in your opinion about a quality of the service.

A CODE	A STATEMENT	1	2	3	4	5
Q1	In this institution a patient is the centre of a treatment	1	2	3	4	5
Q2	In this institution health problems are adequately treated.	1	2	3	4	5
Q3	The personnel of this institution treats patients with a great deal of politeness.	1	2	3	4	5
Q4	The personnel of this institution acts in a stimulating way.	1	2	3	4	5
Q5	The personnel of this institution works with a modern equipment.	1	2	3	4	5
Q6	The personnel of this institution usually gives me correct answers to my questions.	1	2	3	4	5
Q7	The personnel of this institution is always prepared to help me.	1	2	3	4	5
Q8	The personnel of this institution talks to patients in an adequate tone.	1	2	3	4	5
Q9	The personnel of this institution makes me feel safe during a treatment.	1	2	3	4	5
Q10	The personnel of this institution helps in an adequate and quick way.	1	2	3	4	5
Q11	The personnel of this institution is friendly.	1	2	3	4	5
Q12	The personnel of this institution is of orderly appearance.	1	2	3	4	5
Q13	The personnel of this institution respects my privacy.	1	2	3	4	5
Q14	The personnel of this institution performs services according to the promises.	1	2	3	4	5
Q15	The personnel of this institution took a quick care of me.	1	2	3	4	5
Q16	The personnel of this institution is familiar with its area of work.	1	2	3	4	5
Q17	The personnel of this institution is well trained and familiar with trends.	1	2	3	4	5
Q18	I trust advice which I receive in this institution.	1	2	3	4	5
Q19	Places of this institution are clean.	1	2	3	4	5
Q20	Interior arrangement and organisation of this institution arise trust and homeliness in my perception.	1	2	3	4	5

Q21	This institution has an appropriate parking place.	1	2	3	4	5
Q22	This institution has enough personnel who is able to pay attention to each individual patient.	1	2	3	4	5
Q23	This institution is situated in a good location.	1	2	3	4	5
Q24	Working time of this institution is adjusted to patients.	1	2	3	4	5

In the second part we are interested in your opinion about reputation of this institution.

A CODE	A STATEMENT	1	2	3	4	5
R1	This is a reputable institution.	1	2	3	4	5
R2	This is a trustworthy institution.	1	2	3	4	5
R3	This institution has a good status in the surrounding.	1	2	3	4	5
R4	The employees of this institution are very respected in public.	1	2	3	4	5
R5	The management of this institution is very respected in public.	1	2	3	4	5
R6	Media usually report positively on this institution.	1	2	3	4	5
R7	This is a successful institution.	1	2	3	4	5
R8	My friends and relatives think highly of this institution.	1	2	3	4	5

In the third part we are interested in your opinion about a perceived value of this institution.

A CODE	A STATEMENT	1	2	3	4	5
PV1	This institution offers me a lot of benefits.	1	2	3	4	5
PV2	In this institution ratio between all the received benefits and all losses that I have at the same time is fair.	1	2	3	4	5
PV3	I perceive more good than bad things in this institution.	1	2	3	4	5
PV4	All in all, this is the institution with a high value of services.	1	2	3	4	5
PV5	Expenses, which I have when visiting this institution, are acceptable to me.	1	2	3	4	5

In the fourth part we are interested in your opinion about non-monetary expense aspects which you perceive while being treated in this institution.

A CODE	A STATEMENT	1	2	3	4	5
P1	There are often waiting queues in this institution.	1	2	3	4	5
P2	Work runs quickly in this institution.	1	2	3	4	5
P3	A visit to this institution is very stressful for me.	1	2	3	4	5
P4	I think that my friends and relatives would have a better opinion about me, if I visited another institution of its sort.	1	2	3	4	5
P5	A treatment in this institution represents a great deal of expense to me.	1	2	3	4	5

In the fifth part we are interested in your opinion about satisfaction regarding a treatment in this institution.

A CODE	A STATEMENT	1	2	3	4	5
SAT1	All in all, I am satisfied with services of this institution.	1	2	3	4	5
SAT2	I am satisfied with doctors' work.	1	2	3	4	5
SAT3	I am satisfied with work of nurses and other non-medical	1	2	3	4	5

		1	2	3	4	5
	personnel.					
SAT4	Services of this institution fulfil my expectations.	1	2	3	4	5
SAT5	In comparison with other institutions of this sort, a level of satisfaction in this institution is high.	1	2	3	4	5
SAT6	A decision to visit this institution was a smart decision.	1	2	3	4	5
SAT7	I have mostly good experience with this institution.	1	2	3	4	5

In the sixth part we are interested in your opinion about loyalty to this institution.

A CODE	A STATEMENT	1	2	3	4	5
LOY1	If I need a medical help ever again, I will choose this institution.	1	2	3	4	5
LOY2	I will recommend this health institution to anyone who will ask me for advice.	1	2	3	4	5
LOY3	I always speak positively about this health institution.	1	2	3	4	5
LOY4	I will become a client of another institution of its sort.	1	2	3	4	5

Table 2

Statistical parameters of first questionnaire

	Q	R	PV	P	S	L
CRONBACH	0,94	0,95	0,90	0,40	0,93	0,90
KMO	0,94	0,93	0,88	0,50	0,92	0,79
BARLETT (p)	0,00	0,0	0,0	0,0	0,0	0,0
EXPLAINED VARIANCE (%)	64	74	73	65	70	83

CRONBACH…Cronbachov coefficient α

KMO…Kaiser - Meyer – Olkin

BARLETT…Barlett test

Q…Quality

R…Reputation

PV…Perceived value

P…Price

S…Satisfaction

L…Loyalty

Table 3

A second questionnaire

DATE OF REALISATION:	ANONYMOUS SURVEY	

Dear patients,
We kindly ask you to fill in the questionnaire regarding your expectations and satisfaction in consideration with a treatment in this institution. Only with the help of your answers we will be able to improve our work at the department.
There are available individual statements which you have to evaluate on a scale from 1 to 7, whereas the evaluation 1 means, that you absolutely do not agree with the statement, and the evaluation 7 means that you completely agree with the statement.
(Circle a number from 1 to 7)

V1: A QUALITY OF THE SERVICE and the personnel in the hospital:

I absolutely do NOT agree — I absolutely agree

	1	2	3	4	5	6	7
The personnel of this institution makes me feel safe during a treatment.	1	2	3	4	5	6	7
The personnel of this institution helps in an adequate and quick way.	1	2	3	4	5	6	7
The personnel of this institution is familiar with its area of work.	1	2	3	4	5	6	7
The personnel of this institution is well trained and familiar with trends.	1	2	3	4	5	6	7

V2: GENERAL REPUTATION OF THE HOSPITAL and the personnel:

I absolutely do NOT agree — I absolutely agree

	1	2	3	4	5	6	7
This is a reputable institution.	1	2	3	4	5	6	7
This is a trustworthy institution.	1	2	3	4	5	6	7
This institution has a good status in the surrounding.	1	2	3	4	5	6	7
The employees of this institution are very respected in public.	1	2	3	4	5	6	7
The management of this institution is very respected in public.	1	2	3	4	5	6	7
Media usually report positively on this institution.	1	2	3	4	5	6	7
This is a successful institution.	1	2	3	4	5	6	7
My friends and relatives think highly of this institution.	1	2	3	4	5	6	7

V3: A PERCEIVED VALUE OF THE HOSPITAL:

I absolutely do NOT agree — I absolutely agree

	1	2	3	4	5	6	7
I perceive more good than bad things in this institution.	1	2	3	4	5	6	7
All in all, this is the institution with a high value of services.	1	2	3	4	5	6	7
This institution has a good ratio between all the received benefits and all losses that I have at the same time.	1	2	3	4	5	6	7
They try to perform the work well in this institution.	1	2	3	4	5	6	7

V4: TIMELINE AND EXPENSE aspects of the visit:

I absolutely do NOT agree — I absolutely agree

	1	2	3	4	5	6	7
Work runs quickly in this institution.	1	2	3	4	5	6	7
A visit to this institution ruins my other plans, which leads to inconvenient situations.	1	2	3	4	5	6	7
A treatment in this institution represents a great deal of expense to me.	1	2	3	4	5	6	7
A visit to this institution is connected with material expenses (travel expenses, a parking fee, a loss of earnings, payment of the service).	1	2	3	4	5	6	7
A visit to this institution is connected with non-material expenses (it takes me a lot of time, I wait for an examination for a long time …).	1	2	3	4	5	6	7

V5:	SATISFACTION with a treatment in the hospital:	I absolutely do NOT agree					I absolutely agree	
Services of this institution fulfil my expectations.		1	2	3	4	5	6	7
A decision to visit this institution was a smart decision.		1	2	3	4	5	6	7
I have mostly good experience with this institution.		1	2	3	4	5	6	7
It came to my notice that other people have good experience with this institution.		1	2	3	4	5	6	7

V6:	RECOMMENDATIONS:	I absolutely do NOT agree					I absolutely agree	
I will again choose this institution in the future in case I need it.		1	2	3	4	5	6	7
I would be happy to recommend this institution also to other people.		1	2	3	4	5	6	7
I always speak positively about this health institution.		1	2	3	4	5	6	7
Even if there were more similar institutions nearby, I would prefer this institution to the others.		1	2	3	4	5	6	7

Table 4

Statistical parameters of second questionnaire

	Q	R	PV	P	S	L
CRONBACH	0,87	0,96	0,83	0,88	0,89	0,90
KMO	0,82	0,94	0,83	0,82	0,80	0,82
BARLETT (p)	0,00	0,00	0,00	0,00	0,00	0,00
EXPLAINED VARIANCE (%)	72,2	76,8	67,7	65	76,1	77,4

CRONBACH…Cronbachov coefficient α

KMO…Kaiser - Meyer – Olkin

BARLETT…Barlett test

Q…Quality

R…Reputation

PV…Perceived value

P…Price

S…Satisfaction

L…Loyalty

Table 5

CFA for a different constructs

	R^2	STAND. ITEMS	AVE	CR
QUALITY			0,72	0,88
The personnel of this institution makes me feel safe during a treatment.	0,99	1,0		
The personnel of this institution helps in an adequate and quick way	0,59	0,77		
The personnel of this institution is familiar with its area of work.	0,57	0,75		
SATISFACTION			0,69	0,87
A decision to visit this institution was a smart decision.	0,52	0,72		
I have mostly good experience with this institution.	0,99	1,00		
It came to my notice that other people have good experience with this institution.	0,57	0,75		
REPUTATION			0,80	0,94
This institution has a good status in the surrounding	0,78	0,88		
The employees of this institution are very respected in public.	0,82	0,91		
The management of this institution is very respected in public.	0,84	0,92		
Media usually report positively on this institution.	0,78	0,88		
PERCEIVED VALUE			0,68	0,86
I perceive more good than bad things in this institution.	0,53	0,73		
All in all, this is the institution with a high value of services	0,50	0,97		
This institution has a good ratio between all the received benefits and all losses that I have at the same time.	0,99	0,71		
PRICE			0,72	0,88
A visit to this institution ruins my other plans, which leads to inconvenient situations.	0,55	0,74		
A treatment in this institution represents a great deal of expense to me.	1,00	1,00		
A visit to this institution is connected with material expenses (travel expenses, a parking fee, a loss of earnings, payment of the service).	0,60	0,77		
LOYALTY			0,78	0,91
I always speak positively about this health institution.	0,67	0,82		
I will again choose this institution in the future in case I need it.	0,66	0,81		
I would be happy to recommend this institution also to other people.	0,99	1,0		

R-square can take on any value between 0 and 1, with a value closer to 1 indicating that a greater proportion of variance is accounted for by the model

STANDARD ITEM..should beb > 0,70

CR…should be > 0,7

AVE..should be > 0,5

Table 6.

A final questionnaire

DATE OF REALISATION:	ANONYMOUS SURVEY	

Dear patients,
We kindly ask you to fill in the questionnaire regarding your expectations and satisfaction in consideration with a treatment in this institution. Only with the help of your answers we will be able to improve our work at the department.
There are available individual statements which you have to evaluate on a scale from 1 to 7, whereas the evaluation 1 means, that you absolutely do not agree with the statement, and the evaluation 7 means that you completely agree with the statement. (Circle a number from 1 to 7)

V1: A QUALITY OF THE SERVICE and the personnel in the hospital:

I absolutely do NOT agree — I absolutely agree

Statement	1	2	3	4	5	6	7
The personnel of this institution makes me feel safe during a treatment.	1	2	3	4	5	6	7
The personnel of this institution helps in an adequate and quick way.	1	2	3	4	5	6	7
The personnel of this institution is familiar with its area of work.	1	2	3	4	5	6	7

V2: GENERAL REPUTATION OF THE HOSPITAL and the personnel:

I absolutely do NOT agree — I absolutely agree

Statement	1	2	3	4	5	6	7
This institution has a good status in the surrounding.	1	2	3	4	5	6	7
The employees of this institution are very respected in public.	1	2	3	4	5	6	7
The management of this institution is very respected in public.	1	2	3	4	5	6	7
Media usually report positively on this institution.	1	2	3	4	5	6	7

V3: A PERCEIVED VALUE OF THE HOSPITAL:

I absolutely do NOT agree — I absolutely agree

Statement	1	2	3	4	5	6	7
I perceive more good than bad things in this institution.	1	2	3	4	5	6	7
All in all, this is the institution with a high value of services.	1	2	3	4	5	6	7
This institution has a good ratio between all the received benefits and all losses that I have at the same time.	1	2	3	4	5	6	7

V4: TIMELINE AND EXPENSE aspects of the visit:

I absolutely do NOT agree — I absolutely agree

Statement	1	2	3	4	5	6	7
A visit to this institution ruins my other plans, which leads to inconvenient situations.	1	2	3	4	5	6	7
A treatment in this institution represents a great deal of expense to me.	1	2	3	4	5	6	7
A visit to this institution is connected with material expenses (travel expenses, a parking fee, a loss of earnings, payment of the service).	1	2	3	4	5	6	7

V5: SATISFACTION with a treatment in the hospital:

I absolutely do NOT agree — I absolutely agree

Statement	1	2	3	4	5	6	7
A decision to visit this institution was a smart decision.	1	2	3	4	5	6	7
I have mostly good experience with this institution.	1	2	3	4	5	6	7
It came to my notice that other people have good experience with this institution.	1	2	3	4	5	6	7

V6: RECOMMENDATIONS:

I absolutely do NOT agree — I absolutely agree

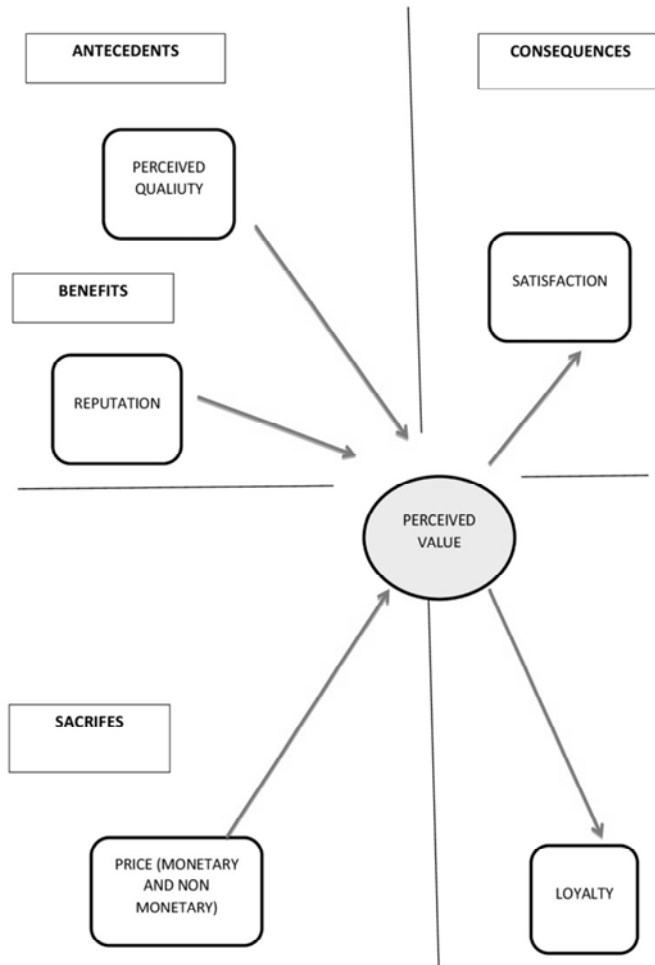| Statement	1	2	3	4	5	6	7
I will again choose this institution in the future in case I need it.	1	2	3	4	5	6	7
I would be happy to recommend this institution also to other people.	1	2	3	4	5	6	7
I always speak positively about this health institution.	1	2	3	4	5	6	7

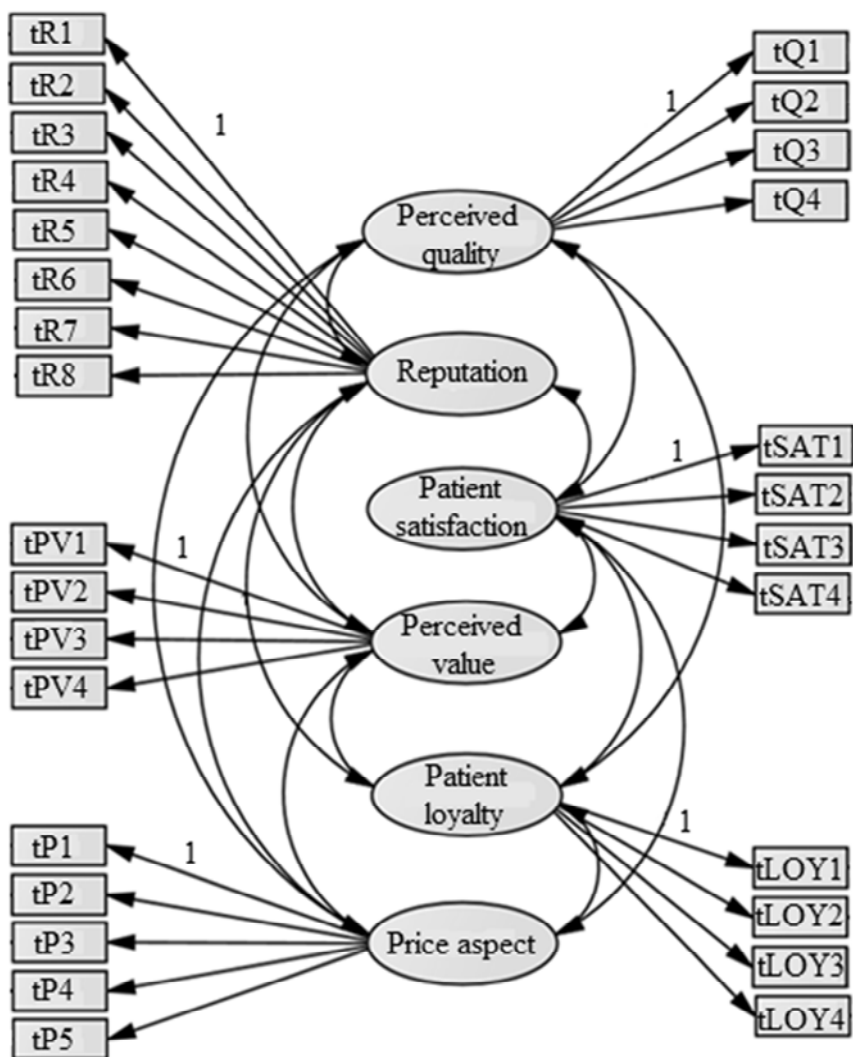Figure 1. Our conceptual model for perceived value in health services

Figure 2. The initial CFA model with all the constructs and the manifested variables

In Figure 2, the connection between the constructs (a) appear as curved lines with double arrows between the Ellipse (the ellipse are constructs). AVE statistics (b) is based on the weights, which are in Figure 2 shown as arrows between the constructs (Ellipse) and the manifested variables (rectangles).
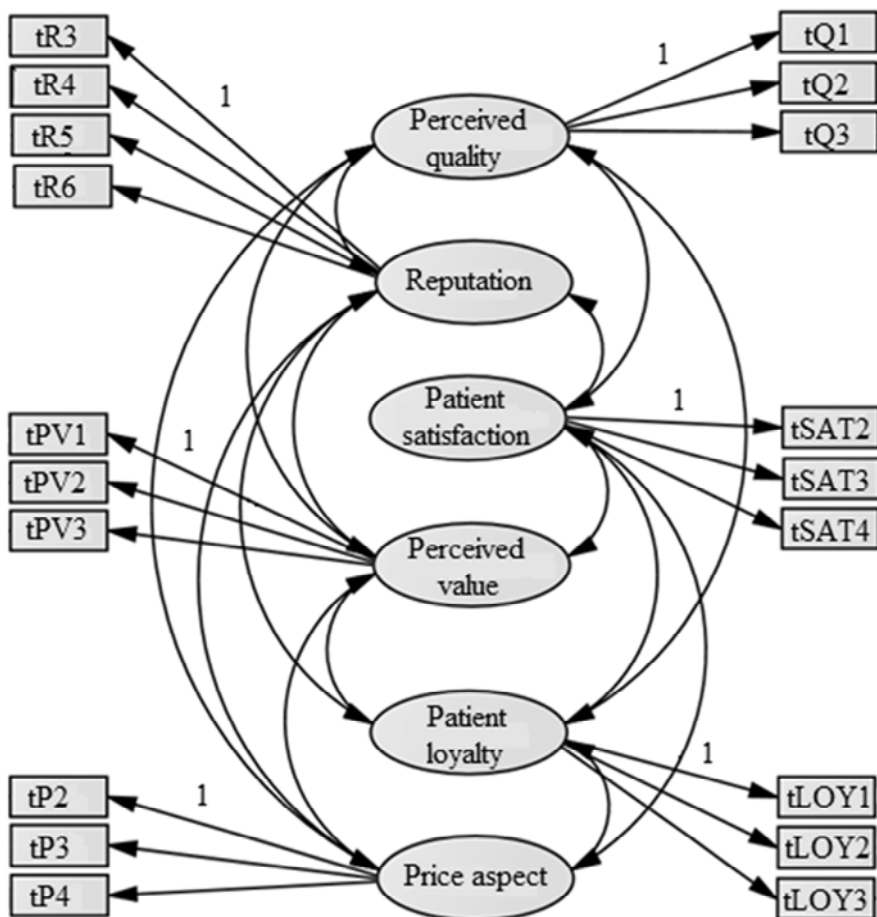
Figure 3. The final CFA model with all the constructs and optimized
manifested variables

In Figure 3, the connection between the constructs (a) appear as curved lines with double arrows between the Ellipse (the ellipse are constructs). AVE statistics (b) is based on the weights, which are in Figure 3 shown as arrows between the constructs (Ellipse) and the manifested variables (rectangles).

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RAZVOJ I VALIDACIJA EVALUACIJSKOG SUSTAVA ZA PACIJENTOVU PROCJENU ZDRAVSTVENIH USLUGA

Sažetak

Pozadina: percipirana vrijednost usluge predstavlja sve važniji koncept u uslužnoj djelatnosti, s pomoću kojega pacijentovu percepciju zdravstvene usluge možemo opisati na značajno složeniji način. Za mjerenje pacijentove percepcije zdravstvene usluge potreban nam je drugačiji mjerni instrument, koji će uzimati u obzir višedimenzionalnost percipirane vrijednosti. Svrha: razviti i validirati novi instrument kojim bi se mjerila pacijentova procjena zdravstvenih usluga nakon tretmana. Metode: razvoj instrumenta sastojao se od izrade testa, smanjenja broja stavki, validacije, evaluacije strukturne i interne konzistentnosti. Koristile su se i eksploratorna i konfirmatorna faktorska analiza (EFA, CFA). Rezultati Crombachova koeficijenta za različite konstrukte iznose: za kvalitetu 0,87, za reputaciju 0,96, za percipiranu vrijednost 0,83, za cijenu 0,88, za zadovoljstvo 0,89, za lojalnost 0,90. Vrijednosti drugih koeficijenata (Kaiser – Meyer – Olkin, Bartlett u objašnjenoj varijanci) također su primjereno visoke. Konačni apsolutni indeksi odgovaranja jesu: Chi-SQUARE 426,3, df = 137, RMSEA = 0,05, NFI = 0,96, CFI = 0,98. Zaključak: mjerni instrument ima karakteristike visoke pouzdanosti i validnosti za mjerenje ishoda nakon tretmana.

Ključne riječi: percipirana vrijednost, zadovoljstvo, kvaliteta, lojalnost, reputacija, cijena, zdravstvene usluge, mjerni instrument

JEL klasifikacija: D12, I10, I11