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ORIGINAL PAPER

Dimensions of service quality and satisfaction in healthcare: a patient's satisfaction index

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Abstract The assessment of patients' satisfaction levels, and the knowledge of what factors influence satisfaction are very important for healthcare managers as it influences healthcare results and healthcare institutions financial results. The objective of this research is to analyse patients' satisfaction levels in a set of four Portuguese primary Healthcare Centres, through the estimation of a satisfaction index, which simultaneously explains which dimensions of healthcare quality influence that satisfaction the most. For that, a conceptual model of patients' satisfaction in primary healthcare was tested using data from a sample of 414 patients. Partial Least Squares path modelling (PLS) was the technique chosen to evaluate the proposed model. The results show that patients' satisfaction is 60.887 in a scale from 1 to 100, revealing only a medium level of satisfaction. It is also possible to conclude that the most important positive effects on satisfaction are the ones linked to the patient/doctor relationship, the quality of facilities and the interaction with administrative staff, by this order.

Keywords Primary healthcare · Satisfaction · Health care quality · Satisfaction index

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1 Introduction

One of the worries that health managers have is to improve overall system effectiveness in order to increase customer satisfaction and loyalty. This objective becomes fundamental, seeing that on one hand it demonstrates the accountability of institutions and on the other hand it influences healthcare results. Patients' satisfaction influences the willingness to follow doctor's prescription, which will in turn influence patients' future satisfaction with healthcare results (MacStravic 1991), preventing and avoiding complaints and lawsuits (Ahorony and Strasser 1993) and influences word of mouth (Venkatapparao and Gopalakrishna 1995). As the American College of Healthcare Executives (2006, p. 6) pointed "If patients are highly satisfied with care in the broadest sense, then the most manageable part of the hospital's mission is achieved."

Given that healthcare Centres constitute the primary element of the healthcare system which patients turn to, it becomes fundamental to assess patients' satisfaction with the service they offer. A better knowledge of what causes patients' satisfaction is valuable for managers in order to make changes in the process.

In Portugal, initiatives to measure patients' satisfaction in Primary Healthcare Centres are still scarce and not very systematic, with the exception of the project for Monitoring Organizational Quality of Healthcare Centres carried out by the Institute for Quality in Health, while however is not focalized solely and exclusively on the measurement of satisfaction.

This investigation intends to analyse the patients' level of satisfaction in Primary Healthcare Centres belonging to the District of Castelo Branco, an interior region of Portugal, through the estimation of a satisfaction index and simultaneously trying to explain which dimensions of healthcare quality influence satisfaction the most.

2 Literature review

2.1 Satisfaction in healthcare

For some researchers patient satisfaction is the result of the gap between expected and perceived characteristics of a service (Fitzpatrick and Hopkins 1983). For Woodside et al. (1989) patient's satisfaction is a special form of attitude; in other words, it is a post-purchase phenomenon which reflects the extent to which a patient liked or disliked the service after having experienced it.

According to Wilton and Nicosia (1986), the most recent models of customer's satisfaction have already stopped handling satisfaction as a static variable, rather conceiving it as an enlarged process or an interaction system around purchase, use and repurchase acts. This new perspective recognizes that the customer psychological reaction to a product cannot be represented as the result of one only episode, but as a series of activities and continuous reactions along time.

In this way, the aggregation of individuals, occasions, stimuli and measurements is a good way to surpass some of the problems related to traditional analysis (Johnson 1995; Johnson et al. 1995). This aggregation is also useful to reduce the

measurement error of the main variables related to satisfaction (Johnson et al. 1995). The Customer Satisfaction Indexes are based on that principle.

According to Anderson and Fornell (2000a, b), a customer satisfaction index measures the quality of goods and services as experienced by those that consume and feel them. It represents the global evaluation of the total experience of purchase and consumption, either actual or anticipated (Fornell 1992; Andersen et al. 1994). This global satisfaction is an important indicator of the past, present and future performance of a business (Anderson et al. 1994).

Customer's satisfaction can be analysed under two different perspectives: as a result or as a process. Satisfaction as a result is concerned with the nature of satisfaction (Oliver 1997). From the other point of view, satisfaction as a process is essentially concerned with its causes (Oliver 1997; Anderson 1993).

For John (1991), patients' satisfaction concept includes both approaches. In this way, patients' satisfaction can be viewed as an attitude resulting from the confirmation or disconfirmation of expectations (result perspective) or as a process, resulting from the level of expectations the patient takes to the service experience (process perspective). Thus, it is not only important to know the result from the service experience, but also what are the causes and dimensions that give rise to satisfaction.

From the literature review on this issue, we can see that the satisfaction formation process is not very consensual either in services, in general, or in healthcare. The conclusions from various studies about customer satisfaction in services found different antecedents in the formation of satisfaction, namely, perceived image, perceived value, expectations, and quality (functional and technical) (ECSI 1998; Anderson and Fornell 2000a, b).

However in the healthcare context some of these antecedents lose influence. For instance, Taylor and Cronin (1994) found that expectations fail to demonstrate a consistent direct relationship with patient's satisfaction. Also, perceived value can be difficult to apply in the healthcare context, since as Peyrot et al. (1993) pointed, usually patients do not know the treatments' real cost, it is difficult for them to evaluate perceived value of healthcare services.

The weakness of some variables in the relationship with satisfaction may be one reason why most of the studies focus, above all, on service quality variables, either functional or technical. However, the most important elements of service quality to each patient may vary depending on the situation each one faces (Mowen, Licata and Mcphail 1993).

2.2 Service quality dimensions

Garland and Westbrook (1989) referred four generic dimensions to assess satisfaction in non-profitable services, namely, service policy, the supplier, the surrounding social environment and the surrounding physical environment, with a superior importance to interpersonal dimensions.

For Donabedian (1980) service quality in health should include an analysis of the structure to achieve a given level of healthcare quality (the characteristics of doctors, hospitals and staff); of the process (interaction with the structure) and of the

result (what happens to the patient after the medical act). Exploring the conjoint effect of the structure and process, Carr-Hill (1992) found that patient's satisfaction can be influenced by six dimensions: medical care and information, food and physical facilities, non-tangible environment, nursing care, quantity of food and appointment bookings.

Nevertheless, it is noticeable that the majority of studies about the service quality in healthcare focus only upon one of the elements. The result dimension suggested by Donabedian (1980) is one of the elements that is not very well studied, which could be due to difficulties in measuring results in healthcare service quality. The problem with measuring healthcare results according to Choi et al. (2005) could be a consequence of the very large period of time between the moment when service is provided and the arising of results. For Boller et al. (2003), the results are a consequence of the service's quality and not a component of it, stressing the importance to focus the structure and the process when analysing service quality in health.

For some researchers it is appropriate to measure the service quality in health using the SERVQUAL scale (Headley and Miller 1993).

According to Parasuraman et al. (1985) the global quality of a service depends on the encounter between expectations and performance level perceptions and can be measured through the five SERVQUAL underlying dimensions: tangible elements (physical facilities, equipment and appearance of personnel), reliability (ability to perform the promised service dependably and accurately), responsiveness (willingness to help customers and provide prompt service), empathy (caring and individualized attention that the firm provides to its customers) and assurance (including competence, courtesy, credibility and security).

The application of SERVQUAL in health service quality analysis showed that intangible elements tend to be more influential than the tangible ones (Kara et al. 2005), although one should always take into account the need to adapt the scale for specific situations.

The study of Venkatapparao and Gopalakrishna (1995) revealed that aspects related to technical quality (the service outcome) were the most important for patients. However, for Peyrot et al. (1993) it is possible to improve patients' satisfaction through the improvement of aspects that are not related to the service's technical quality, but, through aspects related to the quality of processes (functional quality).

For other researchers, patients' satisfaction is better represented through a multidimensional construct, having the evaluations influenced by three principal sources: doctors, the institution rendering the service and the health system (Singh 1990).

We also find that several studies only point to some of these aspects, namely, staff behaviour (Alford 1998), doctor's communication skills (Trumble et al. 2006), patient-perceived nurse caring, nurse/physician collaboration (Larrabee et al. 2004) and good outcomes results (Amyx et al. (2000). Yarnold et al. (1998) in an extensive study on two Emergency Departments found that overall patient (dis)satisfaction with care received is nearly perfectly predictable on the basis of patient-rated expressive qualities of physicians and nurses.

Nevertheless, when dealing with primary healthcare, above all, the doctor's characteristics (Carr-Hill 1992), such as the explanation of what is being done, as

well as the time spent with the patient, is what has the greatest influence upon patients' satisfaction. The second most influential factor on patients' satisfaction is the characteristics of support personnel, where nurses are included and the third are the characteristics concerning access (Otani et al. 2005). In turn, in other studies it was noticeable that the elements related to nurses had the greatest influence upon patients' satisfaction (Otani and Kurz 2004; Carr-Hill 1992).

Bryant et al. (1998) grouped all these variables into four categories:

- socio-emotional variables, referring to the perceptions that patients have of the communication capacities and interpersonal capacities of healthcare services (affection, empathy, politeness);
- system variables, referring to the physical or technical aspects of the local in which the service is provided, such as, the waiting time for the appointment, access to services, technical quality of services, costs, comfort of equipment and the appointment's duration;
- influential variables, such as, list of contacts (family and friends);
- moderating variables, referring to socio-demographic variables and state of health.

3 Method

3.1 Research design

According to Bruhn and Grund (2000), literature about consumer satisfaction/dissatisfaction suggests that the measuring process, apart from measuring satisfaction, should also identify the principal antecedents of satisfaction, its consequences and also, the existing relations among the various variables of the process.

Literature review shows that satisfaction can be influenced by different variables. This study proposes a theoretical model to test which variables have greater influence on patient's satisfaction in primary healthcare. Using the theoretical guidelines provided by literature, the model suggests facilities, administrative staff interaction and the relationship with the doctor and nursing care (see Fig. 1) as main antecedents of patients' satisfaction.

3.2 Sample and data collection

The target population were patients of primary healthcare centres from the District of Castelo Branco, Portugal. Given the information provided by ARS—Regional Health Administration, the entity that manages these primary healthcare centres, we selected Castelo Branco, Fundão, Covilhã and Belmonte health centres to collect data, because they were the four most significant in terms of number of patients.

Data were collected through a questionnaire developed to understand patients' perception, experience and feelings towards the healthcare centre service. The questionnaire was divided in five blocks; the first addressing general information about the individual, frequency and motives for using the healthcare centre. The

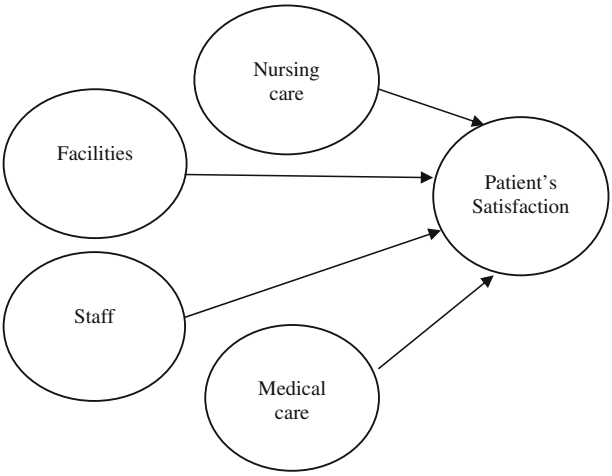

Fig. 1 Conceptual model

next four blocks addressed specific questions about their satisfaction with the centre's facilities, administrative staff, nursing and doctor care. Finally, a question was included to evaluate global satisfaction with the service provided by the centre.

The scales used resulted in part from scales already tested in various studies, despite the verbal context being adapted many times to the reality of healthcare. In this way, scales of multiple items were used in the entire questionnaire, as this allows a reduction in standard error and the dimension of the sample required (Ryan et al. 1995), as well as measurement with greater validity subjective constructs (Hayes 1998; Anderson and Fornell 2000a). Interval scales of seven points were used, since the enlargement of the number of points in the scale allows a reduction in skewness (Fornell 1992).

To measure patients satisfaction, scales already tested by Oliver (1977, 1980), Oliver and Bearden (1983), and Westbrook and Oliver (1981) were used. Those included a measurement of satisfaction, a disconfirmation of expectations, a disconfirmation of needs, a measurement of disconfirmation faced with an ideal healthcare centre.

So, the questions used to question patients' satisfaction were:

1. Considering the global experience with this primary health centre, in general what is your level of satisfaction
2. Until what point has this primary health centre corresponded to your expectations?
3. Until what point has this primary health centre corresponded to your current needs?
4. Imagine a primary health centre, perfect in all aspects. From what distance would you place this health centre to that ideal one.

The estimation of this index was based on the methodology of the European Customer Satisfaction Index (Fornell et al. 1996; Fig. 2).

Fig. 2 General form of the customer satisfaction index

$$Satisfaction\ Index = \frac{\sum_{i=1}^{n} w_i \bar{x}_i - \sum_{i=1}^{n} w_i}{9\sum_{i=1}^{n} w_i} \times 100$$

Were:

W_i - are the unstandardized weights

X_i - are the measurement variables

n - is the number of measurement variables

To measure perceived quality, scales were based on the SERVQUAL (Parasuraman et al. 1988) scale and the attributes were chosen to capture both technical and functional quality.

Data were collected in May 2007 and the final sample size was 414 patients for the four centres.

3.3 Data analysis

To assess the predictive power of the theoretical model, we use Partial Least Squares (PLS) (using SmartPLS 2.0 M3). Partial Least Squares path modelling is a structural equation modelling technique (SEM) that can simultaneously test the measurement model (relationships between indicators or manifest variables and their corresponding constructs or latent variables) also called the outer model and the structural model (relationships between constructs) also called the inner model.

According to Jöreskog and Wold (1982) PLS is primarily intended for causal-predictive analysis. The choice of PLS in this study is due to its nature and the specific objective of finding a better and different approach to understand patient satisfaction with focus on maximizing the explained variance. The PLS algorithm generates loadings between reflective constructs and their indicators and weights between formative constructs and their indicators. It also produces standardized regression coefficients between constructs, and coefficients of multiple determination (R^2) for all endogenous constructs in the model.

A crucial step to test the theoretical model is assessing the accuracy of the measurement model. The objective is to ensure that the measures used are valid and that they adequately reflect the underlying theoretical constructs. The strength of the measurement or outer model for constructs with reflective measures is assessed by looking at individual item reliability; internal consistency and discriminant validity.

4 Results

The measurement model evaluation parameters are presented in Table 1. Individual item reliability is evaluated by examining the loadings (Table 1) of the measures with the construct they intend to measure.

Table 1 Loadings, composite reliability, average variance extracted and significance

Variables	Loadings (O)	Composite reliability (RC)	Average variance extracted (AVE)	Standard deviation (STDEV)	Standard error (STERR)	*T* statistics (|O/STERR|)	Sign (2-Tailed)[a]
Staff		0.93	0.78				
Staff reveal concern in solve my problems (Staf_Prob)	0.94			0.01	0.01	73.93	0.00
Staff explain me what I should do (Staf_explain)	0.93			0.02	0.02	57.54	0.00
Staff is kind (Staf_kind)	0.91			0.02	0.02	38.13	0.00
I don't have to wait to much to talk with staff (Staf_wait)	0.74			0.04	0.04	18.57	0.00
Facilities		0.93	0.56				
Facilities have good appearance (Fac_Aspec)	0.74			0.07	0.07	10.57	0.00
In general facilities are clean (Fac_Clean)	0.80			0.07	0.07	12.23	0.00
Facilities are comfortable (Fac_Conf)	0.78			0.07	0.07	11.81	0.00
It's easy to find information (Fac_Info)	0.71			0.06	0.06	12.00	0.00
Offices for medical consultation have enough space (Fac_Offi)	0.75			0.05	0.05	15.81	0.00
Temperature in facilities is good (Fac_Temp)	0.80			0.06	0.06	12.58	0.00
Facilities are appropriate to handicapped people (Fac_hand)	0.73			0.05	0.05	13.96	0.00
Orientation signs in facilities are clear (Fac_sign)	0.72			0.08	0.08	9.58	0.00
Operating hours of facilities are convenient (Fac_time)	0.71			0.05	0.05	14.83	0.00
WC are Cleanness (Fac_wclean)	0.73			0.06	0.06	12.23	0.00
Medical care		0.94	0.70				
Doctors are competent (Med_Compet)	0.88			0.03	0.03	28.46	0.00
Doctors clear explain the treatment I have to do (Med_Explain)	0.92			0.01	0.01	64.20	0.00

Table 1 continued

Variables	Loadings (O)	Composite reliability (RC)	Average variance extracted (AVE)	Standard deviation (STDEV)	Standard error (STERR)	*T* statistics (|O/STERR|)	Sign (2-Tailed)[a]
Doctors are kind (Med_Kind)	0.89			0.02	0.02	42.14	0.00
Doctors are in time (Med_Pontaul)	0.68			0.05	0.05	13.07	0.00
I don't have to wait to much for the doctor arrival (Med_Wait)	0.59			0.06	0.06	10.51	0.00
Doctors reveal concern in solve my problems (Med_care)	0.93			0.02	0.02	61.37	0.00
Doctors do every is possible to solve my problems (Med_effort)	0.91			0.02	0.02	38.79	0.00
Nursing care		0.96	0.80				
Nurses always are available to care of me (Nur_Disp)	0.92			0.03	0.03	35.09	0.00
Nurses explain me what they are doing (Nur_Explain)	0.93			0.02	0.02	50.55	0.00
Nurses reveal concern in solve my problems (Nur_care)	0.93			0.02	0.02	52.57	0.00
Nurses are competent (Nur_compet)	0.92			0.03	0.03	27.92	0.00
Nurses are kind (Nur_kind)	0.91			0.03	0.03	35.41	0.00
I don't have to wait to much time to be cared (Nur_wait)	0.74			0.05	0.05	15.57	0.00
Satisfaction		0.94	0.81				
In general I' satisfied with this healthcare centre (Sat_Glob)	0.91			0.03	0.03	33.76	0.00
This healthcare centre match my expectations (Sat_expe)	0.93			0.01	0.01	62.17	0.00
This healthcare centre is very close to an ideal centre (Sat_idea)	0.83			0.03	0.03	25.07	0.00
This healthcare centre meet my needs (Sat_nece)	0.93			0.02	0.02	43.86	0.00

[a] Based on a bootstrap procedure with 500 sub-samples

Using the rule of thumbs of accepting items with loadings of 0.707 or more, we notice that only two indicators (med_esp and med_pont) of the 31 did not reach the level of acceptable reliability. However, as pointed by Chin (1998); Barclay et al. (1995); Falk et al. (1992), loadings of at least 0.5 might be acceptable if some other questions measuring the same construct present high reliability scores. Upon examination of loadings and cross-loadings matrix the med_esp and med_pont indicators were retained for the analysis, as they presented loadings >0.5 and they do not show higher loadings in any other constructs than in the one they were intended to measure.

The significance of loadings was checked with a bootstrap procedure (500 subsamples) for obtaining *t*-statistic values. All loadings were significant at 0.999 level (based on $t_{(499)}$, two-tailed test).

The internal consistency for a given block of indicators can be assessed using the composite reliability index from Fornell and Larcker (1981). Based on the guidelines provided by Nunnaly and Bernstein (1994); Hair et al. (1998) who suggests 0.7 as a benchmark, the measurement model reveals adequate internal consistency for all constructs since all have measures of internal consistency that exceed 0.92.

Average variance extracted (AVE) (Fornell and Larcker 1981) assesses the amount of variance that a construct captures from its indicators relative to the amount due to measurement error. Average Variance Extracted by the constructs is, in all cases, above the minimum threshold of 0.5, meaning that 50% or more variance of the indicators is accounted for.

The next stage is discriminant validity evaluation. Discriminant validity indicates the extent to which a given construct is different from all other latent constructs. One criterion for adequate discriminant validity is showing that the construct shares more variance with its measures than it does with other constructs in the model (Barclay et al. 1995). This was assessed comparing the square root of the AVE (diagonal values) with the correlations among reflective constructs to ensure that the square root of the AVE was greater than the correlation between a construct and any other construct (Chin 1998). All constructs were more strongly correlated with their own measures than with any other of the constructs, suggesting good convergent and discriminant validity (Table 2).

After assuring the validity of the measures, we can look at the structural model that represents the relationships between constructs or latent variables hypothesized in the theoretical model. Figure 3 provides a graphical representation of the results.

Since the primary objective of PLS is prediction, the goodness of a theoretical model is established by the strength of each structural path (the hypotheses) and the combined predictiveness (R^2) of its exogenous constructs (Chin 1998). Our model has an R^2 of 0.597 meaning that 59.7% of the variance of patient satisfaction is explained by the constructs proposed.

In PLS, the hypotheses are tested by examining path coefficients and their significance levels. Following Chin (1998), bootstrapping (with 500 resamples) was performed to obtain estimates of t-statistic values for examining the statistical significance of path coefficients. The results show that only nursing care is not significant at 0.05 level.

Table 2 Discriminant validity coefficients

Constructs	Staff	Facilities	Medical	Nursing	Satisfaction
Staff	0.88				
Facilities	0.60	0.75			
Medical care	0.57	0.57	0.84		
Nursing care	0.59	0.59	0.56	0.89	
Satisfaction	0.60	0.65	0.68	0.59	0.90

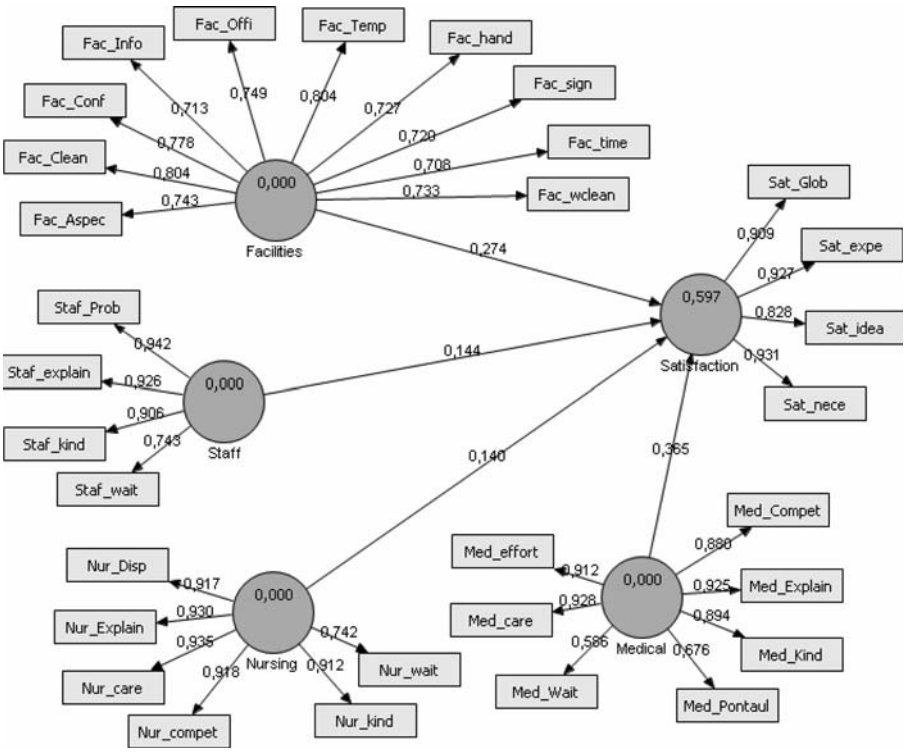

Fig. 3 Final structural model

Looking only at statistical significant relationships, we notice that medical care holds the greatest path coefficient suggesting that patient perception of quality and empathy of medical care delivered to them is the stronger predictor of satisfaction.

The perception about facilities appears as the second most important factor to patients' satisfaction. Though all indicators of the facilities perception construct present high loadings, special attention should be given to temperature, comfort and cleanness, as they present the stronger correlations with the factor.

The perception of the service provided by administrative appears to be the weakest predictor of satisfaction in our model. Looking at the construct indicators,

Table 3 Communality and *GoF*

Construct	Communality	R^2
Staff	0.78	
Facilities	0.56	
Medical care	0.70	
Nursing care	0.80	
Satisfaction	0.81	0.60
Average	0.73	0.60
GoF		0.661

we see that empathy with administrative staff is important to determine the patient's perception.

In order to globally evaluate our model, a *Goodness of Fit* (*GoF*) *index* was computed (Table 3). This *GoF* measure is the geometric mean of the average communality and the average R^2. Its value ranges from 0 to 1, where greater values indicate better predictive ability. For our model, the *GoF* was 0.661, as can be seen in Table 3. The Stone–Geisser (Stone 1974; Geisser 1975) test of predictive relevance was also used as an additional assessment of model fit. According to Chin (1998) the Q^2 statistic is a jackknife version of the R^2 statistic, and represents a measure of how well observed values are reconstructed by the model and its parameter estimates. Models with Q^2 greater than zero are considered to have predictive relevance and models with higher positive Q^2 values are considered to have more predictive relevance. All Q^2 coefficients are greater than zero showing that the model has predictive power.

Having estimated and analysed the model we proceed with the estimation of the satisfaction index, to quantify patients' global level of satisfaction with healthcare centres. The formula adopted for its calculation was that proposed by the methodology of the National Customer Satisfaction Indexes (Fornell et al. 1996; ECSI Technical Committee 1998; see Fig. 2). As one can observe in Table 4, the global index of patients' satisfaction with healthcare centres is 60 points, on a scale of 1–100.

5 Conclusions

The purpose of this research was to examine patients' satisfaction at primary healthcare centres through the estimation of a satisfaction index, and simultaneously

Table 4 Satisfaction index

Index indicators	Non-standardised regression weights (*Wi*)	Indicators mean (X_i)	$\Sigma W_i{*}X_i$	ΣW_i	Index value (1–100)
Sat_Glob	0.179	4.900			
Sat_nece	0.177	4.900	3.250	0.698	60.887
Sat_expe	0.166	4.640			
Sat_idea	0.177	4.170			

analyse the main contributors to the process of satisfaction formation. This index of satisfaction gives healthcare managers the ability to evaluate patients' satisfaction and improve service quality and user satisfaction throughout the management of the relevant antecedents identified by the proposed model.

In general, the results support the emerging literature concerning patient satisfaction, service quality and consumer satisfaction. Together, the set of four constructs used in this study explain 59.7% of the variance in satisfaction, results that can be considered satisfactory given the complex nature of consumer satisfaction.

The results show that patients' satisfaction in this group of Portuguese healthcare centres is of 60,887 in a scale from 1 to 100, which reveals only a medium level of satisfaction.

A large part of patient satisfaction in this study could be attributed to the perception of patient/doctor relationship. The model shows that doctors' care construct presents a much larger positive impact on satisfaction than any of the other constructs. Thus, we concluded that doctor care is more important in improving overall satisfaction than are other constructs. These findings support research results from Otani et al. (2005), Rao et al. (2006) that point out that doctor's interaction with patients has a significant influence on their satisfaction. Patient perceptions of doctor's competence and concern about their problems are important determinants of patient experiences and should be considered in future studies that are designed to assess the evaluation of satisfaction.

An examination of the path coefficients reveals that all four constructs are positively related with patients' overall satisfaction. Three of the four constructs show a statistically significant prediction effect on patient satisfaction and only nursing care fails the significance test. These results concerning nursing care are somehow surprising, as they differ from other research findings regarding the importance of nursing care on satisfaction (Otani et al. 2005). A possible explanation to this lies in the fact that in a primary healthcare centre, patients interact much more with doctors and administrative staff than with nursing personnel. In this type of healthcare centres, the doctor is the focus of the patient's experience. The loadings in Table 1 suggest that the doctors' ability to explain how treatment should be done, the effort they made to solve patients problems and the concern showed with patients' problems are the main contributors to satisfaction with doctors.

The second most important dimension seems to be the perception about the centre's facilities. Several studies have pointed to the importance of facilities quality in patient satisfaction with healthcare services (Carr-Hill 1992). Present findings suggest that facilities' cleanness, temperature and comfort have the largest impact on positive perception about facilities and consequently on satisfaction. However, it is interesting to note that all the attributes used in this research have a high predictive value.

The other two constructs (administrative staff and nursing care) have the lowest path coefficient. Looking at the loadings for the nursing construct, we notice that waiting time for nursing services appears to be the least important attribute to patient perception. This effect constitutes a rather interesting point that can possibly be explained by the low level of patients' expectations about the willingness to wait or that patients do not interact so much with nurses. In both cases, further

exploration of this result is needed in order to provide managers with the knowledge to optimize human resources in nursing care.

The measurement of the construct satisfaction presented a very high composite reliability (0.94) and the results show in agreement with Oliver (1977, 1980) that measures such as correspondence to patients' expectations, correspondence to patients' needs, a global satisfaction measure and distance to an ideal healthcare centre are valid measures to measure satisfaction in healthcare as shown in Table 1. Correspondence to patients' expectations and needs were the ones that explained more variance in the construct satisfaction. Bearing this in mind this it is important that healthcare managers first analyse patients' expectations and needs about the healthcare service.

In conclusion, the present study found that constructs related to the facilities' quality and relationships with doctors have the most important positive effects on satisfaction. For healthcare managers this investigation emphasizes the need to maintain high standard facilities and work closely with doctor in order to find ways to perfect the relationship between doctors and patients. Finally, from these results and from previous studies reviewed, we think that, although current constructs seem to explain a fair part of satisfaction, it is therefore recommended that deeper and innovative investigations should be made to explore new variables in order to get better predictions, for example, through a deeper understanding of the effects of government health policies on patients perceptions and expectations of healthcare services.

5.1 Limitations and future research

In spite of the contribution that this research may offer in deepening the study of patients' satisfaction in primary healthcare in Portugal, this study has several limitations. First it should be taken into consideration that this was an exploratory model, and that it is important for other researchers to consolidate some of the concepts and confirm or reject the conclusions drawn. Second, this study only focuses on quantitative results, but it will be important to improve this research with qualitative data, possibly about patients' expectations in order to compare those with present results. Third, our ability to draw causal inferences is limited by the cross-sectional nature of the study. Finally, it should be noticed that the conclusions of our investigation are limited by the sample size and the geographical representation of the study.

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