

Determinants of user's satisfaction in health plan services

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ABSTRACT

New standards for supplementary health services have been introduced in Brazil by the regulatory agent in order to raise the level of user satisfaction. In this context, understanding the critical factors for user satisfaction can help a supplemental healthcare enterprise to add value to its services, expand its customer base, and become more competitive. The purpose of this article is to propose a logistic regression model to estimate the factors that determine the satisfaction of health plan users. The model was created from a consumer survey data. The research results put in evidence the critical role of factors associated with operations management to improve user satisfaction, considering that the significant variables of the model were: physical facilities of the hospital, appointment marking system and number of hospitals agreed with the health plan.

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1. INTRODUCTION

Supplemental health can be understood as an activity that involves the operation of health care and health plan under governmental regulation. The main foci of attention of supplemental health literature are on understanding the North American market, and in general, studies are directed towards understanding the information asymmetries in this market, and the characteristics of the American model, Medicare (SESTELO; SOUZA; BAHIA, 2013).

In Brazil the expansion of this market is recent and has shown growth in the last ten years. From 2003 to 2013 there was a 53.3% increase in the number of those insured (ANS, 2013). As determinants of this situation what can be pointed out are such matters as the rise in the life expectancy of the population in Brazil and the growth in income (IBGE, 2013).

This scenario of rising demand for health plan in Brazil requires the expansion of the production capacity, improved quality of services, etc. Thus it is fundamental for established companies to develop strategies to retain current users and to win future clients.

The literature endorses the role of quality in services in making clients loyal and adding a competitive edge to the provider. This is because when quality levels increase there is a return of clients to the hospitals (ARASLI, *et al.*, 2008) as well as when the company knows the factors that are important for adding to user satisfaction, they can create bonds with their clients, as shown by (KESSEKER; MYLOOD, 2011), who state that patients who value relationships are more likely to remain faithful to the hospital, in which they receive something in return from such a relationship.

Thus, to raise the quality of health services in a given region there is a need for continuous assessment of users' perceptions about the health services received (SENIC; MARINKOVIC, 2013). That is to say, if they know the determinants of users' perception, this can make a difference in drawing up a competitive strategy for the company.

This article sets out to conduct an exploratory analysis of the main determinants of user satisfaction of supplemental health in Recife, Brazil in order to provide an indication of the variables that contribute most to a positive perception of the service offered, bearing in mind that this positive perception contributes to the user being satisfied and loyal.

2. CONCEPTUAL STRUCTURE

2.1 – Supplemental health services in Brazil

Supplemental health care can be defined as the activity that involves the operation of private health care plans under government regulation (ANS, 2012). In Brazil, this sector falls under the auspices of the National Supplemental Health Agency (ANS), a body which is set up to regulate, standardize, control and inspect the provision of private health services. Although most people in Brazil have right of access to the government health service network, in practice most people who have private health plan rarely, if ever, use the government service. In this sense, they regard their private health plan as an alternative to the government service and not as supplementary to it.

The health supplement market has grown significantly in recent years in Brazil. In June/2013, 49.2 million people were the beneficiaries of health care plans in the country, a total that has grown by 53.5 % in ten years. Running counter to the growth of the market, the number of service providers has decreased. In March/2013 there were 959 active service providers, which is 29.7 % less than in the same period of 2003. The turnover of the industry in 2012 was about US\$44.9 billion (ANS 2013).

An important feature of this sector is the contact interface with the user. Such contact may take on the following characteristics: Health plans that have their own network of hospitals, clinics and laboratories, health plans that accredit third party hospitals, laboratories and clinics to provide health services; and health plans that use a combination of their own and an outsourced structure for the delivery of services.

2.2 – Quality in health services

One of the important applications of the study of service quality is the study on the quality of health services, which, according to Murti, Deshpande and Srivastava (2013) can be divided into two dimensions of quality: technical quality and functional quality. Technical quality can be seen as the completeness of diagnoses and procedures, as well as compliance with the specifications of the area, while functional quality refers to the way the health service is delivered to the patient (DONABEDIAN, 1980).

Consumers of health services are better able to assess the functional quality. Eleuch (2011) asserts this claim because patients do not have the proper knowledge to assess the more technical issues of quality. However, they are more qualified to assess the functional dimensions, such as cleanliness, service, and so forth.

The different fields of quality in health services have been tackled recently by academia, and have highlighted the following areas: hospitals (CHAHAL; KUMARI, 2010; AAGJA; GARG, 2010; ELEUCH, 2011; AMIN; NASHARUDDIN, 2013); relationship with doctors (GILL; WHITE, 2009; GAUR *et al*, 2011; SUKI *et al*, 2011), use of information technology platforms (AKTER *et al*, 2010; HADWICH *et al*, 2010), and health plan companies (WOLLMANN *et al*, 2012; SHAFIE; HASSALI, 2013).

Duggirala *et al.*, 2008 enumerate seven dimensions of quality in the services of a hospital in a developing country (quality of personnel, infrastructure, administrative procedures, clinical care procedures, security, experience in healthcare and social responsibility). Chahal and Kumari (2010) based on the model by Brady and Cronin (2001) suggest that patients' perception of quality occurs in three dimensions: the physical environment, which includes the ambiance and social and tangible factors; quality of interaction, namely, the service providers' attitude, behavior and knowledge of the processes; and the result of quality which can be measured by waiting time, satisfaction and loyalty to the establishment. For Anbori *et al.* (2010), the loyalty of users of hospitals is affected by the cost of service, warranty, reliability and empathy provided in private hospitals.

Given the above, it is concluded that the services provided by hospitals impact the perception of the quality perceived by the user of health services, thus formulating *hypothesis H1*. This hypothesis is tested in the survey from the following variables related to hospitals: service from staff, service rendered, time taken to render the service, availability of beds and physical facilities.

H1 – The services provided by hospitals have a positive impact on the quality perceived by users of the health plan. (H1-1 – service given by staff, H1-2 – service rendered, H1-3 – time taken to provide service, H1-4 – availability of beds, and H1-5 – Physical facilities)

For Murti *et al.* (2013) patients do not seek a hospital based only on low prices but on account of its reputation and quality in its hospital services. There is great interaction with

employees (receptionists, doctors, nurses, etc.), all of whom contribute to the perception of quality.

With more specific regard to the interaction between users and service providers, Gaur *et al.* (2011) state that the relationship between doctors and patients is significantly influenced by the interaction behavior of service providers (physicians) and by increasing patients' trust in these professionals.

Based on these statements it is concluded that the services provided by physicians (in clinics) influence the user's perception of the quality of the health plan, *hypothesis H2*. This hypothesis is validated from the following variables related to physicians/medical clinics: service from staff; service rendered; time taken to be served; system for scheduling appointments; and physical facilities.

H2 – The services provided by doctors/ medical clinics have a positive influence on the user's perception of the quality of the health plan. (H2-1 – being attended to by staff, H2-2 – service rendered, H2-3 – time taken to be attended to, H2-4 – system for making appointments, and H2-5 – physical facilities).

As already shown, in the Brazilian supplemental health plan sector there are different configurations of rendering services (see Section 2.1). However, all health plans have a section for bureaucratic services, for user services, for making/approving consultations, examinations and other procedures. Thus, the quality perceived by the user in relation to health plan goes beyond the health service environment and affects areas related to administrative activities and routines provided by the health plan insurer to the user.

According to Camgoz-Akadag *et al.* (2013), the behavior and attitude of staff has a great impact on how the service is evaluated. Another factor that may influence the assessment of a health plan is waiting time. For Uehira and Kay (2009), waiting time is a source of dissatisfaction for the patient, and for Bielen and Demoulin (2007), experiences of waiting have a typically negative effect on the consumer's perceptions. From this information it is concluded that being attended to by front office staff, and characteristics related to waiting time and the variety of services provided by the health plan have an impact on satisfaction with the plan. This fact is formalized in *hypothesis H3*, which is derived from the 6 sub-hypotheses presented below:

H3 – The services provided by the front office staff of the health plan positively influence the quality perceived by the user of the health plan (H3.1 – being attended by staff,

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H3-2 – system for making appointments, H3-3 – variety of specialties met, H3-4 – number of physicians by specialty, H3-5 – types of hospital accredited, and H3-6 – number of hospitals accredited).

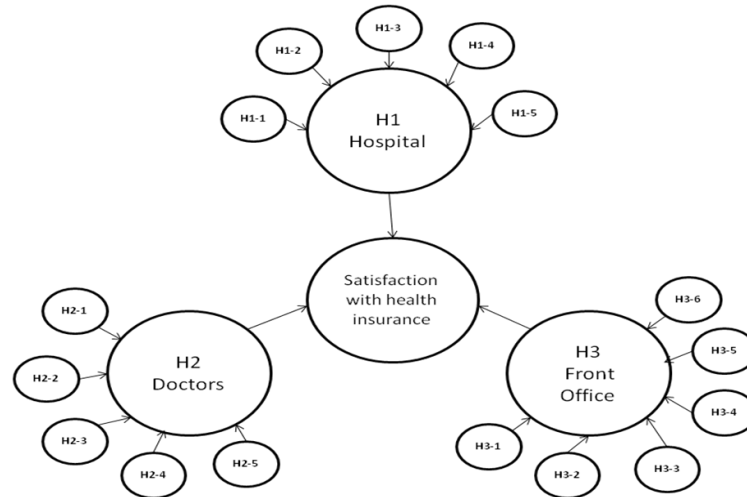
Some studies indicate vectors of satisfaction of users of health plan in different parts of the world. Mershed, Busse and Van Ginneken (2012) in a study on the determinants of satisfaction with the Syrian health system show that some critical issues for increased use of health plan in the country, which are factors associated with the price and capacity to pay, time waiting time and extent of coverage. Lee, Suh and Song (2007) to explore the determinants of user satisfaction of a system of public health insurance in South Korea identified factors associated with place of residence, insured type, relationship between respondent and householder, perceptions of health status and benefit cost ration are key to satisfaction with health insurance. Wollmann *et al.* (2012) analyzed what the most important consumers attributes are for health plan consumers in Curitiba, Brazil by the Analytic Hierarchy Process (AHP) method and found that the attribute most valued by health plan users is price. This study ignores the effect of price on user satisfaction, and gives space to factors endogenous to rendering the service.

2.3 – Conceptual model

In the review of the literature section of this study, three hypotheses were derived from the existing theoretical contribution. Each is related to an interface of the supplemental health service (hospitals, medical clinics and front office of the health plan).

To understand more specifically the impact of each interface on satisfaction with the health plan, a total of sixteen sub-hypotheses for each interface was introduced. Thus, it is intended based on the different degrees of quality perceived in the areas of the user/ health-plan interface to ascertain the actual impact of these on end-user satisfaction.

Figure 1 - Conceptual model of the determinants of the quality perceived in health plans.



Source: Prepared by the authors (2017).

3. METHODOLOGY

The phases over which this exploratory research study was developed follow the steps proposed by Bertrand and Fransoo (2002) for carrying out good quantitative research, i.e. a description of the process under study; specification of the model/solution/tests; and perceptions between the solution and the conceptual model.

The data used were provided by the Mauricio de Nassau Research Institute, and applied in the city of Recife, state of Pernambuco, Brazil, in 2012.

The questionnaire was designed by one of the authors, a researcher of this institute. To measure satisfaction with the various dimensions of the supplemental health services supplied in the region, the questions were drawn up based on a Likert scale (1 - very dissatisfied, 2 - dissatisfied, 3 - neither satisfied nor dissatisfied, 4 - satisfied and 5 - very satisfied).

The sample was selected from a sampling plan stratified from a two-stage cluster. In the first stage, the census sectors were determined at random and then a fixed number of people was selected in accordance with the sample quotas of the variables of gender and age. 624 interviews were conducted. This number was based on a simple random sample with an estimated 95% confidence level and an estimated margin of error of 4.0 percentage points.

The hypotheses proposed in this research were tested using binary logistic regression which had satisfaction with the health plan as the dependent variable.(1- satisfied and 0-

dissatisfied) and the explanatory variables are the 16 sub-hypotheses presented above and some demographic variables.

To illustrate the relationship of all the independent variables with the dependent variable, first of all, a regression model containing all the dependent variables was built. However, the best choice of model was based on the maximum likelihood ratio test between the models. The variables that entered the model were selected based on the Stepwise Forward method. The modeling was performed using SPSS statistical software.

4. RESULTS

4.1 Profile of the sample

The average age of the respondents was 39.78. In terms of education, 94.1% of the respondents reported that their total schooling was in high school, individuals with college degrees represent only 5.9% of the total sample. The respondents had relatively low levels of household income, since 61.9% of respondents had a monthly income of less than \$605. Summarizing the demographic profile of respondents, in general they were: middle-aged, with a median education and low income level. Table 1 shows the demographic profile of the 624 respondents of the survey.

Table 1 - Profile of survey respondents

Variable	Catogories	n	%
Gender	Female	342	55.2
	Male	278	44.8
Age	16-24	111	17.9
	25-34	146	23.5
	35-44	126	20.3
	45-59	143	23.1
	>60	94	15.2
Marital status	Single/Divorced/Widowed	287	46.2
	Married	334	53.8
Employment status	Employed	443	71.1
	Unemployed	175	28.9
Highest qualification	Elementary School	323	51.8
	High School	264	42.3
	Higher Education	37	5.9

Estimated monthly household income (US\$)	<302	133	22.3
	303-604	236	39.6
	605-1510	180	30.2
	1511-3020	39	6.5
	>3021	8	1.3

Source: Prepared by the authors (2017).

4.2 - Quantitative validation of the hypotheses proposed

To investigate the hypotheses of the proposed model, we chose a model of binary choice, logistic regression was chosen to determine the most important constructs for determining the satisfaction of supplemental health plan users. A literature review presents successful cases in which this technique was used to determine the most significant variables for the probability of the occurrence of an event. Maciejewski (2004) identified what the variables are that contribute to the likelihood of acquiring a health plan by using a binary logistic regression, in which the explanatory variables were spending on health and demographic factors. Similar to the proposed study in this article, Kolodinsk (1999) using an alternative model of binary choice Probit model estimates the impact of four classes of variables on patient satisfaction with a health plan, identifying the patient's personal experience, expectations and judgments about services influence satisfaction with the health plan. Xu and Van de Ven (2012) used binary logistic regression to determine the variables that affect the level of information available to users of health plan in China.

First of all, to examine how the likelihood of satisfaction with the health plan is subject to action from the different interfaces of the services provided by health plan, a binary logistic regression that included all explanatory variables in the regression model was undertaken. The results are given in Table 2 below:

Table 2 - Variables in first equation

Variable	B	S.E.	Wald	DF	Sig.	OR	95,0% C.I.for OR	
							Lower	Upper
HP_Service by Employee	-.936	.499	3.517	1	.061	.392	.147	1.043
HP_Making Appointments	1.133	.408	7.734	1	.005	3.106	1.397	6.906
HP_Medical SpecialtiesServed	.825	.521	2.503	1	.114	2.281	.821	6.337
HP_DoctorsBySpeciality	-.316	.545	.337	1	.562	.729	.250	2.122
HP_Types of Hospital	-.249	.674	.137	1	.712	.780	.208	2.919

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HP_Number of Hospitals	1.055	.677	2.433	1	.119	2.873	.763	10.819
HO_Service by Employee	-.365	.455	.642	1	.423	.694	.284	1.695
HO_Service	.035	.489	.005	1	.943	1.036	.397	2.699
HO_Waiting Time	-.469	.418	1.263	1	.261	.625	.276	1.418
HO_Avail. of Hospital Beds	.333	.285	1.362	1	.243	1.395	.798	2.438
HO_Physical Facilities	1.494	.584	6.539	1	.011	4.454	1.417	13.995
DO_Service by Employee	1.228	.645	3.630	1	.057	3.415	.965	12.080
DO_Service	.146	.510	.081	1	.775	1.157	.426	3.143
DO_Waiting Time	.755	.430	3.074	1	.080	2.127	.915	4.943
DO_Making Appointments	-.122	.365	.112	1	.738	.885	.433	1.808
DO_Physical Facilities	-.636	.682	.870	1	.351	.529	.139	2.016
Age	-.020	.024	.704	1	.401	.980	.935	1.027
Income	-.558	.340	2.686	1	.101	.572	.294	1.115
Gender (1)	-.793	.550	2.073	1	.150	.453	.154	1.332
Marital Status(1)	.127	.614	.043	1	.836	1.136	.341	3.782
Constant	-10.073	2.542	15.706	1	.000	.000		

Fonte: Prepared by the authors (2017).

The regression coefficients presented in Table 2 illustrate that the variables which show OR (odds ratios) greater than unity are variable that are critical for the probability of satisfaction with the health service plan. Of the group of variables related to hospitals, the significant variables in this first model were: the physical facilities of the hospitals and services provided in the hospital. In the physicians Interface, the significant variables are: services from staff of medical clinics, waiting time in medical clinics. However, it is in relation to the service provided by the front office of the health plan that there is the highest number of critical variables: the systems for making appointments under the health plans, the number of accredited hospitals, and the medical specialties offered. The above variables are presented in descending order of OR, i.e., ranging from the greatest potential for an increase in the probability of satisfaction with the service, to the lowest increase in this probability.

However, despite the information brought to light by this regression model, some variables do not pass the hypothesis test for the significance of the estimated parameters. Despite the informative nature of the estimators, the statistics presented by some parameters are unreliable. Bearing this problem in mind, a second model of logistic regression using the same variables was drawn up but in this model, the Stepwise Forward method was selected as it inserts at each iteration, the significant variables of the model at the end of which all that remains are the parameters that have a relationship consistent with the dependent variable. The final model is shown below:

Table 3 - Variables in final equation

Variable	B	S.E.	Wald	df	Sig.	OR	95,0% C.I.for OR	
							Lower	Upper
HPMakingAppointments	.949	.224	17.976	1	.000	2.582	1.665	4.003
HP_NumberOfHospitals	.779	.260	8.980	1	.003	2.179	1.309	3.627
HO_Physical Facilities	1.265	.392	10.416	1	.001	3.543	1.643	7.639
Constant	-9.455	1.765	28.689	1	.000	.000		

Source: Prepared by the authors (2017).

From the results of the second regression model, three critical variables were obtained for determining the satisfaction of supplemental health plan users. These are: HO_Physical Facilities (physical facilities of hospitals), HI_MakingAppointments (system for making appointments under the health plan) and HI_NumberOfHospitals (number of hospitals accredited to the health plan).

The most critical variable for user satisfaction is the physical set-up of the hospitals. According to the model, for each increase in user satisfaction with the facilities of hospitals (1- very dissatisfied to 5- very satisfied), there occurs an increase that is 3.54 times higher in the likelihood of user satisfaction with the plan (OR: 3.54 95% CI 1.64-7.63). When the rise in a level in the satisfaction with the system of making appointments occurs, the likelihood of user satisfaction grows 2.582 times (OR: 2.582 95% CI 1.66-4), with respect to the number of private hospitals, this ratio is 2.179 times (OR: 2.179 95%CI 1.3-3.62 for each unitary increase).

The proposed model shows a number of cases correctly predicted of 82% and is also shown to be statistically significant because it rejects the null hypothesis (β_0, β_1 and $\beta_2=0$) in the likelihood ratio test. Therefore, the estimated parameters are significant. This fact is endorsed by the low p - value.

According to the model, the other variables were not considered relevant for the increase in the likelihood of satisfaction with the supplemental health service.

5. PRACTICAL IMPLICATIONS

In a booming market like that of supplemental health in Brazil, to develop the most appropriate strategy to acquire and retain new customers is vital to the medium and long-term result of the company. However, gaining and maintaining clients depend on the level of service provided. Thus, a fundamental issue for the development of a competitive strategy is to identify the critical factors that lead to the satisfaction of users of health plans.

This study presupposes a conceptual model of the determinants of satisfaction with supplemental health services, i.e. how users form their feelings of satisfaction/ dissatisfaction with the health plan contracted. Based on the review of the literature and observation of the characteristics of this market in Brazil, it is assumed in the study that satisfaction with the service is derived from the interaction with three areas characteristic of supplemental health services: the hospitals, clinics and front office of the health plan. The hospital interface consists of 5 sub-dimensions; the medical clinical interface also comprises 5 dimensions and the front office interface consists of six dimensions.

The results of the regression model used confirmed the importance of two interfaces proposed for determining the satisfaction of individuals with health plan. The hospital interface, H1, was represented by the variable H1-5, which contributes 3.54 times to the likelihood of satisfaction with the plan, for each unitary increase in the measurement scale of this variable. The other interface supported by the regression was the front office of the health plan, hypothesis H3, the sub hypotheses H3-2 and H3-6. In the former, the contribution of the unitary increase to the likelihood of satisfaction with the plan is of the order 2.58 and in the latter, 2.17.

The first result is the manifestation of the approach by Chahal and Kumari (2010) which was based on the model by Cronin and Brady (2001), namely, the importance of the physical environment dimension for determining quality. Therefore, it is critical for the health plan company to ensure that the physical facilities of their own hospitals or of accredited hospitals satisfy users.

The second result confirms the perception of the importance of waiting time for satisfaction with the health service, as shown by Mershed, Busse and Ginneken (2012), Uehira and Kay (2009) and Bielen and Demoulin (2007). Moreover, this result has a connection with the framework of providing this type of service in Brazil, since based on a large volume of complaints from users; the Brazilian supplemental health regulatory agency has introduced rules establishing a minimum period for making appointments (ANS 2013).

The third result refers to the number of private hospitals, which is about the availability of beds and reducing waiting time, bearing in mind that health plan networks with few hospitals centralize the care of a large number of users, a fact that confirms there are queues and delays in being attended to.

One of the main results of the survey is the indication that the potential sources of aggregating consumer satisfaction are not activities directly related to the health service itself, but rather to activities related to the organization and management of the productive structure of the health plan; problems with the physical arrangement of facilities; planning productive capacity; work design; information systems, and so forth. In other words, disciplines that are external to the health sector.

This is a fact that points to the potential of adding efficiency to such organizations using knowledge of the critical factors for user satisfaction as well as techniques and operational management procedures to improve the level of the services provided.

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