Original Article Pol J Public Health 2019;129(2): 47-51

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The application of "the patient satisfaction assessment" as a method for assessing hospital management efficency

Abstract

Introduction. When assessing the effectiveness of hospital management through measures of patient satisfaction, it is possible to go beyond the frameworks of the social efficiency assessment, obtaining generalized assessments of an institution. They are based on the answers to the question if patients would be willing to recommend the institution to a member of the family or a friend. Next point is establishing correlation relationships between these assessments and other measures of effectiveness, for example the value of contracts concluded with the National Health Fund (NFZ).

Aim. The aim of the article is to determine the usefulness of the patient satisfaction survey as a method enabling the assessment of the management efficiency of a given medical facility in terms of the selected parameters.

Material and methods. The source of the research material are the reports on the patient satisfaction assessments carried out among the patients of the Provincial Specialist Hospital in Biała Podlaska in the years 2008-2013. It was hypothesized that the higher the value of the contract with the NFZ, the greater patients' satisfaction expressed in their generalized assessments in the given years and, on the contrary, the more positively assessed by patients hospital, among other things due to the quality of the health services, the higher the value of contracts concluded with the NFZ by the given institution. At the same time, on the basis of the data from 2013, it was decided to check whether the opinions expressed by the patients are characterized by objectivism or whether they may be dependent on the hospital ward where the satisfaction survey was carried out - for this purpose the Chi-square independence test was used. The necessary calculations as the part of the statistical analysis were made using the Microsoft Excel spreadsheet.

Results and discussion. The results of the research are a part of the general trend of patient satisfaction surveys, considered as an important source of information on the level of medical services.

Conclusions. The patient satisfaction survey can be considered as a method which enables the assessment of the management efficiency of a given medical facility in terms of the selected parameters.

Keywords: management, efficiency, satisfaction survey, assessment.

DOI: 10.2478/pjph-2019-0011

INTRODUCTION

The aspiration to increase the efficiency of the management of healthcare entities is justified in particular due to the increased demand for hospital care and the rising costs of the health care system [1]. In practical assessment of the economically effective activities in the health care sector, three types are usually used, which were described by S. Palmer and D. J. Torgerson [2], namely: technical efficiency, productive efficiency, and allocative efficiency, which takes into account social efficiency. Hospitals occupy a special position among both healthcare service providers and in the entire health care system due to the complexity of economic and financial issues [3]. The main source of financing public hospitals are the contracts for the provision of healthcare services, concluded with the National Health Fund (NFZ). The development of the value of contracts concluded with the NFZ reflects, to some extent, one aspect of the management efficiency of the institution.

A specific guarantee that the healthcare entity is managed effectively is using not only internal but also external mechanisms of quality assurance, that is, undergoing procedures of the accreditation and the certification of the facility, which means both creating conditions for providing services at the appropriate quality level, as well as the regular patient satisfaction surveys.

The patient satisfaction is defined as the degree to which healthcare is accepted by him/her, taking into account his/her expectations and needs [4]. The term "satisfaction" comes from the Latin words: satis – sufficiently and facere – to do, and thus it means "to do something sufficiently", that is, to meet expectations [5].

When assessing the effectiveness of the hospital management through the measures of patient satisfaction, it is possible to go beyond the frameworks of the social efficiency assessment, obtaining generalized assessments. They are based on the answers to the question whether the patients would

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be willing to recommend the institution to a family member or friends. Next point is establishing correlative relationships between these assessments and other measures of effectiveness, e.g. the value of contracts concluded with the NFZ.

AIM

The aim of the article is to determine the usefulness of the patient satisfaction survey as a method enabling the assessment of the management efficiency of a medical facility in terms of selected parameters.

MATERIAL AND METHODS

The source of the research material are the reports on the patient satisfaction assessments carried out in the years 2008-2013 in the Provincial Specialist Hospital in Biała Podlaska. This allowed us to follow the dynamics of changes over five years, because in 2011, due to the start of many investments and the need to adjust 11 hospital wards to the conditions determined by the Minister of Health in the Regulation of November 10th, 2006 on the requirements to be met as for professional and sanitary facilities and equipment of the healthcare unit [6], patient opinion surveys have not been conducted. Analyzing the data, the attention was randomly focused on four departments: Obstetrics and Neonatology, Invasive Cardiology, Internal Ward and Surgical Ward, although the research covers all branches in the given hospital.

The research tool in the process of patient satisfaction research is a standardized questionnaire prepared by the Quality Department of the given hospital, equipped with a residence card of the patient and the so-called "imprint". The questionnaire was divided into 5 thematic modules allowing to examine: the satisfaction of the access to the facility, reception in the Admission Room, care and relations with medical and nursing staff, housing and food conditions, a module allowing to find out what made the patient chose the Provincial Specialist Hospital in Biała Podlaska, how the stay in this institution is assessed and what changes are worth introducing The applied satisfaction scale VS/VD (very satisfied/very dissatisfied) allowed for assigning the following weights/meanings to particular variants of the answer contained in a residence card:

- "1" for the answer "very dissatisfied";
- "2" for the answer "dissatisfied ";
- "3" for the answer "I have no opinion";
- "4" for the answer "satisfied";
- "5" for the answer "very satisfied."

Additionally, the question was asked whether the hospital is worth recommending to the family members and friends, where the modified five-point Likert scale was adopted, in the range from 1 to 5, which allows for a generalized assessment of the facility.

It was hypothesized that the higher the value of the contract with the National Health Fund, the greater the satisfaction of the patients, expressed in their generalized assessments in individual years and, on the contrary, the more positively hospital is assessed by patients due to the quality of health services, the higher the value of contracts concluded with NFZ by the given institution. Positive verification of the hypothesis is to prove the usefulness of the patient satisfaction survey as a method enabling the assessment of the management efficiency of a given medical facility in terms of selected parameters.

The average score issued by the patients of the four selected departments was calculated as the arithmetic mean weighted for the measurable feature with stepwise variation, repeating the calculation procedure for all years covered by the analysis. Next, on this basis, generalized assessments in individual years were calculated (Table 1).

TABLE 1. Generalized assessments for selected wards in the years covered by the satisfaction survey.

2008			2009			2010			2012			2013		
x_i	n_i	$x_i n_i$	x_i	n_i	$x_i n_i$	x_i	n_i	$x_i n_i$	x_i	n_i	$x_i n_i$	x_i	n_i	$x_i n_i$
1	0	0	1	1	1	1	0	0	1	1	1	1	0	0
2	4	8	2	5	10	2	7	14	2	7	14	2	7	14
3	41	123	3	50	150	3	35	105	3	20	60	3	27	81
4	86	344	4	129	516	4	74	296	4	35	140	4	74	296
5	34	170	5	80	400	5	79	395	5	59	295	5	104	520
$\sum n_i$		165	$\sum n_i$		265	$\sum n_i$		195	$\sum n_i$		122	$\sum n_i$		212
$\sum x_i n_i$		645	$\sum x_i n_i$		1077	$\sum x_i n_i$		810	$\sum x_i n_i$		510	$\sum x_i n_i$		911
$\overline{x}_i$		3.90	$\overline{x}_i$		4.06	$\overline{x}_i$		4.15	$\overline{x}_i$		4.18	$\overline{x}_i$		4.29

Source: Own calculations.

In order to ensure the continuity of the further calculations, collective ratings for 2011 were restored, when satisfaction survey was not conducted due to the modernization of the hospital, using arithmetic means constituting the sum of assessments from 2010 and 2012, divided by 2.

At the same time, on the basis of the data from 2013, presented in the table 2 and showing the structure of respondents by age and education (ratio of women to men: 1.33), it was decided to check whether the opinions expressed by the patients are objective or whether they can depend on the hospital ward where the satisfaction survey was conducted. For this purpose, the Chi-square independence test was used, assuming the significance level $\alpha=0.05$.

TABLE 2. Structure of respondents from selected wards according to age and education criteria

Criteria	Department of Obstetrics and Neonatology		Invasive Cardiology		Department of Internal Medicine		Surgical Ward	
	N	%	N	%	N	%	N	%
AGE								
18-30	21	53.85	0	0.00	1	2.17	3	5.88
31-50	18	46.15	7	9.21	10	21.74	21	41.18
51-70	0	0.00	55	72.37	24	52.17	24	47.06
>71	0	0.00	14	18.42	11	23.90	3	5.88
EDUCATION								
primary	0	0.00	11	14.47	8	17.39	9	17.65
vocational	2	5.13	23	30.26	9	19.57	9	17.65
secondary	7	17.95	24	31.58	18	39.13	9	17.65
postsecondary	2	5.13	5	6.58	4	8.7	6	11.65
higher	28	71.79	13	17.11	7	15.22	18	35.29
TOTAL	39	100.00	76	100.00	46	100.00	51	100.00

Source: Own calculations.

Establishing linear relationships between individual pairs of variables xi (value of the contract with the NFZ) and yi (generalized hospital assessment obtained as a result of patient satisfaction surveys) as the part of the verification of the hypothesis required the determination of Pearson's correlation coefficient, measuring the accuracy of the relationship between the two variables and indicating the direction of correlation and its intensity. The Pearson rxy linear correlation coefficient assumes values between <-1; 1>:

- rxy=0, if the features are linearly uncorrelated;
- rxy=1 if there is a functional linear relationship;
- the sign of the correlation coefficient indicates the direction of dependence ("+" positive correlation, "-" negative correlation);
- the following scale of variation is used to assess the dependence scale:
  - rxy in the range: 0.00-0.3 – weak dependence,
  - rxy in the range: 0.31-0.6 – moderate dependence,
  - rxy in the range: 0.61-1.0 – strong dependence [7]

Additionally, in order to determine what part of the change in dependent variable (effect) is explained by changes in the adopted independent variable (cause), the coefficient of determination was used, which is the square of Pearson's correlation coefficient.

RESULTS AND DISCUSSION

The calculations made it possible to conclude that there is a very strong correlation between the value of contracts with the NFZ in the part devoted to patient treatment and generalized assessments issued by patients of selected hospital departments of the Provincial Specialist Hospital in Biała Podlaska. This is confirmed by the Pearson correlation coefficient rxy (0.9062). The coefficient of determination at the level of 0.8212 indicates that the variability of the assessment issued by patients of the Provincial Specialist Hospital in Biała Podlaska at 82.12% can be explained by the change in the value of contracts with the NFZ in the part devoted to hospital treatment. This is illustrated in Table 3.

Based on the calculations, it was found that the increase in the value of the contracts with the NFZ in the part devoted to hospital treatment is accompanied by the increase in the patient satisfaction.

At the same time, it was found that the patients' opinions examined in 2013 on the services provided by the hospital, apart from the opinions of female patients from the Obstetrics and Neonatology Department, are characterized by a certain objectivity, as confirmed by the statistical analysis. Table 4, in which the calculation results were presented, was divided into two parts, A and B, due to the fact that female patients of the Department of Obstetrics and Neonatology were included in the shortened version of the satisfaction test, which stem from the specificity of their admission to the hospital and their stay in it.

The calculations made allowed to state that:

- there is no correlation between the assessment of the external markings, assessment of all parameters listed in modules 2, 3 and 4 and the evaluation of the cleanness of the patient rooms and the hospital ward where the patient opinion survey was conducted, as $x^2_{emp} < x^2(\alpha, v)$;
- the relationship between the hospital ward, in which the patients' opinion was examined, and the assessment occurs in the case of assessment of internal markings, assessment of access to the car park and equipment of patient rooms ($x^2_{emp} > x^2(\alpha, v)$).

The critical value of a random variable with Chi-square distribution at the assumed significance level α=0.05 and for 12 (modules 1 and 5) and 8 degrees of freedom (modu-les 2, 3 and 4) was taken from the statistical table.

The results of own research are the part of the general trend of patient satisfaction surveys, considered an important source of information on the level of medical services.

The patient, being in the hospital, is an insightful observer, remembering many details, reactions and behaviors he/she comes across [8]. At the same time, however, A. Maciąg and I. Sakowska [9] maintain that real behaviors and feelings of a person, emotions such as hope, anxiety, and stress experienced by patients in the course of the disease may impede the objective assessment of the situation. The negative feelings of the patient, as noted by B. Małecka and J. T. Marcinkowski [8], are sometimes compounded by the ignorance of the professional language used by doctors and medical personnel, by the appearance of the medical equipment which seems unfriendly because it arouses additional fear. Moreover, sociodemographic factors and motivations of patients may influence the subjectivism of the assessment.

TABLE 3. The correlation between the value of contracts with NFZ for hospital treatment and the assessments issued by patients in 2008-2013.

Year	Value of contracts from the NFZ (hospital treatment), thousands zł x_i	Assessment y_i	$x_i - \bar{x}$	$y_i - \bar{y}$	$(x_i - \bar{x}) \cdot (y_i - \bar{y})$	$(x_i - \bar{x})^2$	$(y_i - \bar{y})^2$
2008	63607.11	3.90	-15486.31	-0.23	3484.42	239825668.36	0.0506
2009	70691.31	4.06	-8402.11	-0.07	546.14	70595399.24	0.0042
2010	74042.42	4.15	-5051.00	0.03	-126.28	25512639.72	0.0006
2011	82226.40	4.17	3132.98	0.04	140.98	9815558.46	0.0020
2012	90884.93	4.18	11791.51	0.05	648.53	139039641.26	0.0030
2013	93108.35	4.29	14014.93	0.17	2312.46	196418267.58	0.0272
$\bar{y}$	79093.42	$\bar{x}$ 4.13	s(x)=113534529.10	s(y)=0.01	Σ=7006.26	Σ=681207174.62	Σ=0.0878
Pearson's correlation coefficient r_{xy} = 0.9062							
Coefficient of determination R^2 = 0.8212							

Source: Own calculations.

TABLE 4. Hospital assessment according to selected parameters.

PART A: Modules 1 and 5

Number	Department of Obstetrics and Neonatology					Invasive Cardiology					Department of Internal Medicine					Surgical Ward					Chi-squared test	
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	x^2_{emp}	α
Module 1: External marking																						
N	2	1	7	24	5	0	5	5	37	29	1	2	6	26	11	0	0	7	28	16	19.850	0.05
%	5	3	18	62	13	0	7	7	49	38	2	4	13	57	24	0	0	14	55	31		
Module 1: Internal marking																						
N	2	3	4	26	4	0	3	6	32	35	0	1	5	25	15	0	0	3	28	20	26.979	0.05
%	5	8	10	67	10	0	4	8	42	46	0	2	11	54	33	0	0	6	55	39		
Module 1: Access to the car park																						
N	13	9	9	7	1	10	18	12	17	19	8	11	13	9	5	3	15	16	12	5	26.713	0.05
%	33	23	23	18	3	13	24	16	22	25	17	24	28	20	11	6	29	31	24	10		
Module 5: Cleanliness in patients' rooms																						
N	1	0	2	21	15	0	1	1	21	53	0	0	0	14	32	0	0	2	19	30	19.638	0.05
%	3	0	5	54	38	0	1	1	28	70	0	0	0	30	70	0	0	4	37	59		
Module 5: Equipment in patients' rooms																						
N	0	3	6	23	7	2	2	4	30	38	0	5	1	20	20	0	1	4	22	24	23.802	0.05
%	0	8	15	59	18	3	3	5	39	50	0	11	2	43	43	0	2	8	43	47		

PART B: Modules 2, 3, 4

Number	Invasive Cardiology					Department of Internal Medicine					Surgical Ward					Chi-squared test	
	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	x^2_{emp}	α
Module 2: Time to wait for the admission to the hospital																	
N	1	6	5	32	32	1	5	5	23	12	0	3	3	29	16	6.471	0.05
%	1	8	7	42	42	2	11	11	50	26	0	6	6	57	31		
Module 2: Caring for the patient and politeness of the staff																	
N	1	2	4	27	42	1	2	1	22	20	0	1	1	25	24	5.365	0.05
%	1	3	5	36	55	2	4	2	48	43	0	2	2	49	47		
Module 2: Caring for providing intimacy																	
N	0	3	5	33	35	1	0	3	25	17	0	1	0	29	21	9.957	0.05
%	0	4	7	43	46	2	0	7	54	37	0	2	0	57	41		
Module 2: Equipment of the Admissions Room																	
N	0	0	7	36	33	1	0	6	27	12	0	1	3	32	15	11.033	0.05
%	0	0	9	47	43	2	0	13	59	26	0	2	6	63	29		
Module 2: Providing information by staff																	
N	0	2	4	37	33	1	0	3	27	15	0	1	2	26	22	5.765	0.05
%	0	3	5	49	43	2	0	7	59	32	0	2	4	51	43		
Module 3: Information obtained about the planned course of treatment																	
N	3	2	4	24	43	0	2	2	23	19	0	1	3	24	23	9.056	0.05
%	4	3	5	32	57	0	4	4	50	41	0	2	6	47	45		
Module 3: Information on the risks associated with treatment, research																	
N	2	4	6	29	35	0	2	4	27	13	0	1	5	24	21	8.446	0.05
%	3	5	8	38	46	0	4	9	59	28	0	2	10	47	41		
Module 3: Respect for intimacy while doing research, providing information																	
N	2	2	2	36	34	0	2	2	25	17	0	0	3	26	22	6.112	0.05
%	3	3	3	47	45	0	4	4	54	37	0	0	6	51	43		
Module 3: Care and patient interest																	
N	3	1	1	29	42	0	4	2	22	18	0	1	2	23	25	12.216	0.05
%	4	1	1	38	55	0	9	4	48	39	0	2	4	45	49		
Module 3: Doctors' punctuality																	
N	2	1	1	32	40	0	0	5	23	18	0	0	4	23	24	10.386	0.05
%	3	1	1	42	53	0	0	11	50	39	0	0	8	45	47		
Module 4: Information on patients' rights and ward regulations																	
N	0	2	7	32	35	0	1	1	31	13	1	0	2	24	24	13.055	0.05
%	0	3	9	42	46	0	2	2	67	28	2	0	4	47	47		
Module 4: Organization and method of admission to the ward																	
N	1	2	0	30	43	0	1	1	27	17	0	0	1	23	27	8.747	0.05
%	1	3	0	39	57	0	2	2	59	37	0	0	2	45	53		
Module 4: Respect for intimacy while performing activities																	
N	1	1	0	38	36	0	1	2	25	18	0	0	2	23	26	6.638	0.05
%	1	1	0	50	47	0	2	4	54	39	0	0	4	45	51		
Module 4: Information about the purpose, method of preparation and the course of performed procedures																	
N	1	2	0	34	39	0	0	2	26	18	0	0	1	24	26	8.850	0.05
%	1	3	0	45	51	0	0	4	57	39	0	0	2	47	51		
Module 4: Level and professionalism of the assistance provided																	
N	1	1	0	20	54	0	2	1	21	22	0	0	2	23	26	14.409	0.05
%	1	1	0	26	71	0	4	2	46	48	0	0	4	45	51		
Module 4: Care and interest shown to the patient during the stay																	
N	1	1	2	24	48	0	2	3	22	19	0	0	1	19	31	10.423	0.05
%	1	1	3	32	63	0	4	7	48	41	0	0	2	37	61		
Module 4: Nurses' politeness																	
N	1	1	2	20	52	0	2	0	21	23	0	0	1	18	32	9.969	0.05
%	1	1	3	26	68	0	4	0	46	50	0	0	2	35	63		

Source: Own calculations

The research, conducted in the years 2007-2010 by K. Danielsen and the team, and by U. Y. Findik et al., prove that women's approach is characterized by capriciousness, as they are prone to lower ratings than men [10]. Later, A. A. Anderson and M. A. Zimmerman stated that the variable that affects the satisfaction of patients by differentiating it, is the level of their education [11]. Nevertheless, as J. Krakowiak and A. Marjański emphasize [12], patients, with the inviolability of the right to express opinions, have a peculiar perspective of evaluation, and hospital management including patient satisfaction results is a guarantee of maintaining the facility on the medical services market, even in the presence of strong competition. This statement means that when examining patient satisfaction, feedback and indirect information about the management efficiency of the institution are obtained.

CONCLUSIONS

Positive verification of the hypothesis testifies to the usefulness of the patient satisfaction test as a method to assess the management efficiency of the medical facility in terms of selected parameters, especially that the patients' opinions on the subject of services provided by the Provincial Specialist Hospital in Biała Podlaska are generally objective, as confirmed by the statistical analysis.

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