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Factors Influencing the Opinion of Patients Concerning the Functioning of the Polish Hospital Before and After Ownership Transformation

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Abstract

Studies of satisfaction among patients are a popular and frequently obligatory tool used in improving the quality of medical services worldwide. Becoming familiar with the opinion of the patients enables to adjust the venue to their expectations, thus contributing to the increase in its competitiveness. We aimed to study patients' satisfaction understood as a tool used in increasing the quality of medical services; in addition, we assessed factors that affect a worse review patients gave about the functioning of this Polish hospital before and after its transformation into a commercial company. The study of satisfaction among patients was conducted using an anonymous questionnaire among 2702 respondents before and 2795 respondents after the hospital's transformation. Multivariate logistic regression analysis was applied to statistically analyze the collected empirical material, where the dependent variable was a worse evaluation of respondents concerning the functioning of the hospital. It was demonstrated that both before and after the hospital's transformation into a commercial company, it was education and conditions of housing of patients that determined their opinion about the functioning of the admission center and hospital wards. A higher level of education increases the risk of a worse evaluation of the admission center and hospital wards, whereas higher self-evaluation of housing conditions lowered the discussed risk. Factors that influence the opinion of patients concerning the functioning of the hospital are education, age, marital status, housing conditions of the respondents and also the number of stays at a given hospital, and a conscious choice of the facility in which a patient wished to be treated.

Keywords

hospital, transformation, satisfaction of patients, determining factors, medical service

Introduction

The market of medical services in Poland is currently undergoing a rapid transformation from the system where the state was the only owner and manager, to the system in which many suppliers with the legitimate co-financing of services exist.

The main assumption of the changes taking place at the turn of years in the Polish system of health protection was to improve the level of benefits, increase their accessibility, and improvement of the system's financial liquidity. New regulations opened new possibilities of transforming hospitals' ownerships and medical centers were presented with the possibility to be transformed into commercial companies. The process of transformation is based on liquidation of the Independent Health Care Centre and appointing a subject such as a partnership in its place. Thanks to the completed organizational and legal transformation, there appears a possibility to eliminate some duties that make managing the facility difficult, and it becomes possible to increase access to financial instruments.[1]

Quality management is of particular importance here as it becomes a more and more frequently implemented method of the health managing process both worldwide and in Poland.[1] High quality of health care allows Independent Health Care Centre to supply patients with aid that remains in accordance with their health needs.[2,3] High quality of the provided health services and patients' satisfaction becomes the main factor deciding about the "brand" of a medical

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health center. It is usually assumed that the relationship between a patient, and the subjective evaluation of the level of the service provided and expectations is of key importance.[3] Health care managers realize that to improve health care centers and thus the whole health care system, it is necessary to consider opinion of patients.[4]

The influence of satisfaction of patients on the improvement of medical services quality is proven and broadly discussed in literature.[5-7] The multifaceted evaluation of a medical facility performed by patients is an effective tool that ensures better health care and strengthens taking strategic decisions, lowering the costs, thus fulfilling patients' expectations, and preparing strategy of effective management and supervising progress.[8-10]

A hospital in Tomaszów underwent a transition from a health care center into an Independent Public Health Care Centre Ltd., one of the first Polish hospitals doing so, between August 8, 2008, and June 30, 2009, following the Health Care Institutions Act; as a result, it became a team of identified individuals and assets. Familiarizing with the opinion of patients enables adjusting the center to their expectations and—consequently—contributes to the increase in competition. We aimed to study patients' satisfaction as a tool used in increasing the quality of medical services,[5-7] In addition, we assessed factors that affect a worse review patients gave about the functioning of this Polish hospital before and after its transformation into a commercial company.

Methods

The survey was carried out among the respondents hospitalized at the Polish hospital in Tomaszów (all patients who volunteered between August 8, 2008, and June 30, 2009). The survey included 5497 patients: 2702 before and 2795 after the hospital's transition. It took 2 years to collect all questionnaires—1 year before and 1 year after the transition. Ballot boxes were placed around the hospital, where patients could place their filled questionnaires that had previously been included in the pilot study.[11]

Description of Research Tools

A complete description of research tools and characteristic of the tested groups of respondents before and after the transformation has been published elsewhere.[12]

Methods of Statistical Analysis

Multivariate logistic analysis was used in statistical analysis of the collected empirical material, where the dependent variable was the worse opinion of the respondents concerning functioning of the hospital. The analysis was performed using Statistica 8.0 software. In all performed tests, the null hypothesis was rejected at $P < .05$ level.

Results

In the first stage, dependent variables were defined. For every respondent, an arithmetic mean was calculated out of 10 questions assessing the functioning of the admission center and out of 24 questions assessing the functioning of the hospital wards. Dichotomization of variables describing the averaged opinion of respondents concerning the functioning of the admission center and the hospital wards was performed before and after the transition. The median of the assessment of patients of the functioning of the admission center before the transition was 3, whereas after the transition it was 4.5. In case of hospital wards, the median of assessment before the transition equaled 3, whereas after the transition, it reached 4.17. The averaged opinion of respondents concerning the functioning of the admission center and the hospital wards that was lower than the median was defined as "worse." Both before and after the transition, the averaged assessment of the functioning of the admission center and the hospital wards that were greater than or equaled the median was defined as "better." In the next stage, elements of characteristic of the studied population both before (see Table 1) and after (see Table 2) the transition were juxtaposed, depending on the better or worse review of the functioning of the admission center and the hospital wards. A similar juxtaposition was performed for the analysis of logistic regression that enabled us to define the independent risk factors in the inferior opinion of respondents about the functioning of the hospital before and after the transition.

Risk Factors for the Inferior Opinion of the Admission Center Functioning

It was demonstrated that both before and after the transition of the hospital into a commercial company, patients' education and living conditions determined their opinion about functioning of the admission center. A higher level of education increased the risk of a worse evaluation of the admission center, whereas higher self-evaluation of living conditions lowers the discussed risk. In addition, factors for the contradictory direction of impact on the opinion of respondents before and after the hospital's transformation were identified. An independent risk factor that was inferior in the opinion of the functioning of the admission center before the transition was the older age of respondents. It appeared that such variables as marital status (widow/widower vs a single person) and the number of stays at the hospital (the first stay vs the following ones) lowered the risk of a more inferior evaluation of the admission center before the transition. In the analyzed period after the transition of the hospital into a commercial company, the risk of an inferior evaluation of the admission center was increased by the following variables: marital status (married vs single) and the number of stay at hospital (the first stay vs another one). A conscious choice of

Table 1. Evaluation of the Functioning of the Admission Center and the Hospital Wards Before and After the Transformation, Depending on the Parameters Characterizing a Studied Group of Respondents.

	Admission center				Hospital wards			
	Better grade		Worse grade		Better grade		Worse grade	
	n	%	*n*	%	*n*	%	*n*	%
Age (years)								
<20	12	1.1	16	1.0	17	1.5	11	0.7
21-30	77	7.3	100	6.1	99	8.5	78	5.1
31-40	208	19.7	241	14.7	223	19.1	226	14.8
41-50	309	29.3	490	29.8	347	29.7	453	29.6
51-60	314	29.8	523	31.8	345	29.5	494	32.3
>60	135	12.8	273	16.6	139	11.9	269	17.6
Sex								
Female	703	66.6	1104	67.2	805	68.8	1003	65.5
Male	353	33.4	538	32.8	365	31.2	528	34.5
Place of living								
City	731	69.5	1136	69.2	814	69.6	1056	69.1
Countryside	321	30.5	506	30.8	355	30.4	472	30.9
Marital status								
Single	104	9.8	176	10.7	120	10.2	160	10.5
Married	490	46.4	773	47.0	579	49.4	685	44.7
Divorced	261	24.7	389	23.7	283	24.2	368	24.0
Widow/widower	201	19.0	305	18.6	189	16.1	318	20.8
Education								
Primary school/vocational	391	37.2	572	34.9	406	34.8	558	36.5
High school	488	46.4	793	48.3	526	45.1	757	49.5
University education	173	16.4	276	16.8	234	20.1	215	14.1
Employment								
Unemployed	51	4.8	105	6.4	63	5.4	93	6.1
Temporary employment	312	29.5	468	28.5	352	30.1	429	28.0
Full-time	487	46.1	685	41.7	549	46.9	625	40.8
Farmer	27	2.6	42	2.6	28	2.4	41	2.7
Pension/retirement	179	17.0	343	20.9	179	15.3	343	22.4
Maintenance conditions								
Bad	9	0.9	26	1.6	16	1.4	19	1.2
Average	458	43.4	671	40.9	452	38.7	677	44.3
Satisfactory	479	45.4	814	49.7	572	48.9	723	47.3
Very good	109	10.3	128	7.8	129	11.0	109	7.1
Living conditions								
No flat	8	0.8	15	0.9	13	1.1	10	0.7
Multi-family house	604	57.3	1006	61.2	697	59.6	916	59.8
House	443	42.0	622	37.9	460	39.3	605	39.5
Toilet in the flat								
No toilet and bathroom	21	2.0	42	2.6	23	2.0	40	2.6
Access to toilet only	176	16.7	330	20.1	202	17.3	305	19.9
Toilet and bathroom in the flat/house	858	81.3	1271	77.4	945	80.8	1186	77.5
Which hospital stay								
First	203	19.2	326	19.9	218	18.6	311	20.3
Second	474	44.9	818	49.8	580	49.6	714	46.6
Third or more	379	35.9	498	30.3	372	31.8	506	33.1
Why this hospital								
Had no other choice	274	25.9	408	24.8	301	25.7	381	24.9
Wanted to get treatment at this hospital	332	31.4	480	29.2	383	32.7	430	28.1
Hospital is closest to the place of living	450	42.6	755	46.0	487	41.6	720	47.0
Mode of admission								
Ambulance	213	20.2	288	17.5	238	20.3	263	17.2
Stand-alone application	98	9.3	165	10.0	130	11.1	134	8.8
Doctor's referral	744	70.5	1190	72.4	802	68.5	1134	74.1

*Note.*Better evaluation: evaluation ≥ median for the group. Worse evaluation: evaluation < median for the group. The median for the group both at the admission center and the hospital wards was 3.

Table 2. Evaluation of the Functioning of the Admission Center and the Hospital Wards After the Transformation, Depending on the Parameters Characterizing a Given Group of Respondents.

	Admission center				Hospital wards			
	Better grade		Worse grade		Better grade		Worse grade	
	n	%	*n*	%	*n*	%	*n*	%
Age (years)								
<20	79	5.9	76	5.3	71	5.1	84	5.9
21-30	177	13.1	330	22.9	183	13.2	325	23.0
31-40	183	13.6	239	16.6	192	13.9	232	16.4
41-50	181	13.4	191	13.3	199	14.4	173	12.2
51-60	316	23.5	294	20.4	345	25.0	267	18.9
>60	411	30.5	310	21.5	392	28.4	332	23.5
Sex								
Female	757	56.2	887	61.7	772	55.9	879	62.3
Male	590	43.8	551	38.3	610	44.1	532	37.7
Place of living								
City	779	57.9	852	59.2	796	57.6	840	59.5
Countryside	567	42.1	586	40.8	585	42.4	571	40.5
Marital status								
Single	236	17.5	248	17.3	236	17.1	250	17.7
Married	800	59.4	913	63.5	839	60.7	877	62.2
Divorced	91	6.8	96	6.7	94	6.8	94	6.7
Widow/widower	219	16.3	180	12.5	213	15.4	188	13.3
Education								
Primary school/vocational	673	50.2	550	38.4	690	50.0	535	38.2
High school	488	36.4	618	43.1	512	37.1	597	42.6
University education	179	13.4	265	18.5	177	12.8	270	19.3
Employment								
Unemployed	217	16.2	265	18.5	228	16.5	254	18.1
Temporary employment	110	8.2	168	11.7	122	8.8	159	11.3
Full-time	351	26.2	467	32.5	373	27.0	445	31.7
Farmer	65	4.9	71	4.9	74	5.4	62	4.4
Pension/retirement	597	44.6	465	32.4	582	42.2	485	34.5
Maintenance conditions								
Bad	29	2.2	43	3.0	30	2.2	42	3.0
Average	450	33.6	585	40.8	483	35.0	556	39.7
Satisfactory	594	44.4	645	44.9	592	42.9	650	46.4
Very good	265	19.8	162	11.3	275	19.9	153	10.9
Living conditions								
No flat	9	0.7	25	1.7	8	0.6	26	1.8
Multi-family house	604	44.9	634	44.1	600	43.4	641	45.5
House	733	54.5	778	54.1	773	56.0	743	52.7
Toilet in the flat								
No toilet and bathroom	50	3.7	50	3.5	52	3.8	48	3.4
Access to toilet only	75	5.6	77	5.4	78	5.6	74	5.2
Toilet and bathroom in the flat/house	1221	90.7	1311	91.2	1252	90.6	1288	91.3
Which hospital stay								
First	413	30.7	353	24.6	402	29.2	366	26.0
Second	296	22.0	365	25.4	305	22.1	357	25.3
Third or more	635	47.2	718	50.0	671	48.7	687	48.7
Why this hospital								
Had no other choice	170	12.6	305	21.2	185	13.4	290	20.6
Wanted to get treatment at this hospital	298	22.2	176	12.3	296	21.5	179	12.7
Hospital is closest to the place of living	876	65.2	955	66.5	898	65.1	940	66.7
Mode of admission								
Ambulance	168	12.5	223	15.5	179	13.0	212	15.0
Stand-alone application	186	13.8	259	18.0	188	13.6	259	18.3
Doctor's referral	993	73.7	958	66.5	1015	73.4	942	66.7

*Note.*Better evaluation: evaluation ≥ median for the group. Worse evaluation: evaluation < median for the group. The median for the group evaluating the admission center was 4.5 whereas for the hospital wards it was 4.17.

Table 3. Analysis of the Risk Factors for a More Inferior Evaluation of the Admission Center Before and After the Transformation.

	Before the transformation				After the transformation			
		95% CI				95%CI		
Independent variables	OR[a]	LL	UL	*P*	OR[b]	LL	UL	*P*
Age (years)								
<20	Ref				Ref			
21-30	1.38	0.56	3.38	.4828	1.24	0.81	1.89	.3253
31-40	1.36	0.56	3.29	.4928	0.78	0.49	1.23	.2786
41-50	1.96	0.81	4.75	.1337	0.64	0.40	1.01	.0548
51-60	2.25	0.93	5.45	.0731	0.58	0.37	0.91	**.0179**
>60	3.06	1.18	7.94	**.0215**	0.44	0.28	0.70	**.0005**
Marital status								
Single	Ref				Ref			
Married	0.92	0.69	1.23	.5802	1.56	1.20	2.04	**.0010**
Divorced	0.79	0.57	1.09	.1473	1.35	0.91	2.01	.1335
Widow/widower	0.61	0.42	0.89	**.0102**	1.42	1.00	2.03	.0503
Education								
Primary school/vocational	Ref				Ref			
High school	1.36	1.11	1.68	**.0037**	1.47	1.23	1.76	**<.0001**
University education	1.55	1.13	2.12	**.0063**	1.81	1.40	2.33	**<.0001**
Maintenance conditions								
Bad	Ref				Ref			
Average	0.51	0.19	1.37	.1784	0.83	0.50	1.38	.4775
Satisfactory	0.70	0.25	1.93	.4863	0.59	0.36	0.98	**.0399**
Very good	0.46	0.16	0.99	**.0421**	0.34	0.20	0.58	**.0001**
Which hospital stay								
First	Ref				Ref			
Second	0.97	0.77	1.23	.8124	1.54	1.23	1.92	**.0002**
Third or more	0.67	0.52	0.87	**.0026**	1.58	1.30	1.92	**<.0001**
Why this hospital								
Had no other choice	Ref				Ref			
Wanted to get treatment at this hospital	1.00	0.80	1.26	.9750	0.29	0.22	0.38	**<.0001**
Model summary								
χ^2; R^2		66.2; .033				251; .12		

Note. The evaluation was determined as mean < median for the group; the median for the group evaluating the admission center before the transformation was 3 and after the transformation was 4.5. The table presents models of multivariate logistic regression analysis. OR = odds ratio; CI = confidence interval; LL = lower limit; UL = upper limit;Ref = reference category.

[a]Dependent variable: patients' more inferior evaluation concerning the functioning of the hospital wards (average out of 10 questions < median) before the transformation.

[b]Dependent variable: patients' more inferior evaluation concerning the functioning of the hospital wards (average out of 10 questions < median) after the transformation.

hospital (a person wanted to be treated at this hospital vs a person had no other option) and older age of respondents (a clearly visible gradient of chance ratios) lowered the risk of an inferior evaluation of the functioning of the admission center after the transition (see Table 3).

Risk Factors for the Inferior Evaluation of the Functioning of Hospital Wards

It was determined that both before and after the hospital's transition, education and living conditions determined patients' opinion concerning the functioning of the hospital wards. A higher level of education (high school education vs primary school education) lowered the risk of an inferior evaluation of the hospital wards. In addition, factors for the contradictory impact on the opinion of respondents before and after the hospitals transformation were identified. An independent factor lowering the risk of a more inferior evaluation of functioning of the hospital wards before the transition was the number of stays at the hospital (second, third, or subsequent stay at the hospital vs the first one). After the transformation, the risk of a more inferior evaluation of the

Table 4. Analysis of the Risk Factors for a More Inferior Evaluation of the Hospital Wards Before and After the Transformation.

	Before the transformation				After the transformation			
		95% CI				95% CI		
Independent variables	OR[a]	LL	UL	*P*	OR[b]	LL	UL	*P*
Age (years)								
<20	Ref				Ref			
21-30	1.65	0.65	4.15	.2903	1.16	0.76	1.77	.4893
31-40	1.94	0.78	4.84	.1552	0.61	0.38	0.96	**.0327**
41-50	2.14	0.86	5.34	.104	0.41	0.25	0.65	**.0002**
51-60	2.09	0.83	5.26	.1152	0.36	0.23	0.57	**<.0001**
>60	2.22	0.83	5.99	.1134	0.36	0.23	0.58	**<.0001**
Marital status								
Single	Ref				Ref			
Married	0.79	0.59	1.06	.121	1.60	1.22	2.10	**.0007**
Divorced	0.8	0.57	1.1	.173	1.55	1.04	2.31	**.0331**
Widow/widower	0.8	0.55	1.16	.2346	1.53	1.06	2.22	**.0226**
Education								
Primary school/vocational	Ref				Ref			
High school	1.34	1.08	1.66	**.007**	1.45	1.21	1.73	**.0001**
University education	1.18	0.86	1.63	.2972	2.03	1.57	2.62	**<.0001**
Maintenance conditions								
Bad	Ref				Ref			
Average	1.24	0.60	2.56	.5563	0.77	0.47	1.28	.3104
Satisfactory	1.25	0.61	2.57	.5495	0.62	0.37	1.02	.0611
Very good	0.74	0.35	0.99	**.0463**	0.31	0.18	0.52	**<.0001**
Which hospital stay								
First	Ref				Ref			
Second	0.65	0.51	0.81	**.0002**	1.32	1.06	1.65	**.0136**
Third or more	0.54	0.42	0.70	**<.0001**	1.25	1.02	1.52	**.0280**
Why this hospital								
Had no other choice	Ref				Ref			
Wanted to get treatment at this hospital	1.16	0.84	1.59	.3708	0.38	0.29	0.50	**<.0001**
Model summary								
χ^2; R^2	81; .04				216; .1			

Note. The evaluation was determined as mean < median for the group; the median for the group evaluating the hospital wards before the transformation was 3 and after the transformation was 4.17. The table presents models of multivariate logistic regression analysis. OR = odds ratio; CI = confidence interval; LL = lower limit; UL = upper limit; Ref = reference category.

[a]Dependent variable: patients' more inferior evaluation of the functioning of the hospital wards (average out of 24 questions < median) before the transformation.

[b]Dependent variable: patients' more inferior evaluation concerning the functioning of the hospital wards (average out of 24 questions < median) after the transformation.

hospital wards was increased by the following variables: marital status (married, divorces, widow/widower vs single person) and the number of stays at hospital (second, third, or subsequent stay at the hospital). It appeared that a conscious choice of hospital (a person wanted to be treated there vs a person had no other option) and older age of respondents (a clearly visible gradient of chance ratios) lowered the risk of a more inferior evaluation of the functioning of the hospital wards after the transformation (see Table 4).

All of the above-presented risk factors were of rather independent character. Ratios of chances were estimated on the basis of logistic regression analysis results in multifactor models. Variables presented in Tables 3 and 4 in bold present the final models. The influence of the type of a hospital ward was included in the evaluation of hospital wards.

Discussion

Analysis of the collected empirical material allowed to identify a number of risk factors contributing to the inferior opinion of respondents concerning the functioning of the hospital before and after its transformation into a commercial company. Education, age, marital status, living conditions of the respondents and the number of hospital stays, and conscious

choice of the facility in which a patient wished to be treated were included among the most important factors determining the opinion of patients. In the study of satisfaction among patients carried out by other authors, similar variables that influenced the opinion of patients about a facility were identified. Among some of the most frequently mentioned variables, the following were included: age, level of education, and economic status of the studied.[13-18] As the analysis presented in this work showed, patients' sex had no impact on their opinion about hospital's functioning. A similar lack of dependency was found in the publications of other authors.[13,17,18] Determining the risk factors allowed to point the way forward in the quality management at this hospital so as to improve the opinion of patients concerning the hospital's functioning. Young patients who are also better educated and living in worse conditions should be of particular importance here. In light of the obtained results, it seems necessary to attempt defining the expectations of the listed groups of patients concerning the hospital. It may be assumed that more frequent hospitalizations are connected with a more severe illness, which may influence a patient's worse psychological state and thus a more inferior opinion concerning the facility this patient is treated at. It is also probable that the worsening evaluation of the hospital during subsequent stays results from the lack of further modernization and improvement that would meet the patients' expectations that they hold.

A tendency to issue a worse assessment in the time prior to the hospital's transformation was presented mostly by a group of elderly people, that is, those between the ages of 51 and 60 years and above. After the hospital's transition into a commercial company, a reverse situation was observed. With the increased age, the risk of a more inferior assessment lowered both for the admission center and the hospital wards. It may be assumed that the changes connected with the process of the hospital's transformation met mostly the needs of the elderly people.

The risk of a more inferior evaluation of the hospital was significantly lower among people who have consciously chosen this hospital as the place in which they wanted to be treated. This positive tendency proves that the hospital did meet the expectations of people who consciously entrusted the employees of this facility with their health.

While conducting the analyses of risk that would influence the more inferior evaluation of medical facilities in Poland, the changes and events taking place in this country cannot be overlooked as they influence the patients and thus their opinion about the system and the health care facilities. Patients frequently have problems with an objective evaluation of quality and the level of difficulty of the performed treatments as well as the risk involved with the medical procedures. It is the duty of the hospital personnel to provide the hospitalized person with such information, whereas the State should convince patients that the main value of the health care system is the protection of health and life of its citizens. However, the transformation into a commercial company (regardless of the type of ownership) can have a negative effect on hospital profitability. Younis, for example, showed that small rural hospitals that converted to critical access status enjoyed improvement in financial status; however, hospitals that converted to for-profit status did not improve in financial status, and showed a lower earning after the conversion.[19] Also, as showed by Younis and Forgione, some other actions, such as introducing the Balanced Budget Act and Balanced Budget Refinement Act, leading to financial cuts for hospitals had a negative effect on the ability of hospitals to continue offering safety-net services and negatively affected the length of stay in a hospital.[20]

It is also very important to consider the expectations and suggestions of patients while introducing the changes. This applies to both macro-changes (health care system) and micro-changes (hospital). Patients need to be educated systematically that the introduced changes are beneficial for them and are determined by their actual needs.

Conclusions

1. Factors influencing the evaluation of patients concerning the functioning of the hospital are the following: education, age, marital status, living conditions of the respondents and the number of stays at a given hospital, and their conscious choice of the facility in which they wanted to be treated.
2. To improve the hospital's further evaluation by patients, a particular importance should be placed on the needs of young people who are better educated and live in worse living conditions.
3. There is a need for further, systematic studies of satisfaction of patients to answer the following questions: Will higher satisfaction scores make the health care organization more efficient, competitive, and profitable? Will higher scores improve quality, and not just the patients' perception of quality? Will higher scores increase patients' access? Will higher scores help lower the costs, or improve financial performance?

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