Effects of Changes in Ownership of the Polish Hospital on the Patients’ Opinion About Its Functioning

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Abstract
System changes in health care centers have been directed at introducing such marketing elements into the Polish health care system as managerial approach to managing the centers and contracting medical services and quality management. High quality of the medical services and patients’ satisfaction became the key factors deciding about “the brand” of a health care center. The aim of the work was to assess the effect of changes in ownership of the hospital on the patients’ opinion about its functioning. Patients’ satisfaction survey was carried out through an anonymous questionnaire among 2702 respondents before and 2795 respondents after the transformation of the hospital. Multivariate analysis of variance (MANOVA) was used to analyze the collected empirical material. The assessment of the functioning of the admission center and hospital wards was significantly higher among the respondents asked after the transformation of the hospital as opposed to the assessment before it. Transforming the public hospital in Poland into a commercial company helped improve its functioning in the opinion of patients. There is a need to carry out further systematic research into the patients’ satisfaction better adjust the hospital’s offer to the needs of the hospitalized people.

Keywords
hospital, patients’ satisfaction, transformation, medical service, patient’s needs

Introduction
Introducing a reform of health care system in Poland caused significant changes in the range of functioning and organization of medical centers.¹,² As a result of this reform, there were many redundancies at hospitals, the number of beds was reduced and some units were even closed or transformed into commercial companies.³,⁴ The process is based on the liquidation of the independent health care center and establishing an entity such as a partnership instead.

A hospital in Tomaszów underwent a transition from a health care center into an Independent Public Health Care Centre Ltd. between August 8, 2008, and June 30, 2009, as one of the first Polish hospitals, following the Health Care Institutions Act; as a result, it became a team of identified individuals and assets.

High quality of the provided medical services and patients’ satisfaction became the main factor that determined the changes.⁵-¹⁰

Familiarizing with the opinion of patients enables adjusting the center to their expectations and consequently, contributing to the increase in competition. This work aimed at assessing the influence of these changes in ownership on the patients’ opinion about the hospital’s functioning. The following assumptions were achieved: improvement in the provided services, higher quality of services, employing highly qualified personnel, thanks to the increased level of salaries that was the result of higher profits, creation of a new administration structure, and finally the increase in the institution’s competition. The objective which was specifically aimed at, was the answer to the question which areas of the hospital’s functioning need improvement, which will also help to assess a better strategy for further transitions of hospitals throughout Poland.

Methods
The survey was carried out among the respondents hospitalized at the Polish hospital in Tomaszów (all patients who

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Table 1. Characteristic of the Tested Groups of Respondents Before and After the Transformation.

|                                      | Before transformation (n = 2702) | After transformation (n = 2795) |
|--------------------------------------|----------------------------------|-------------------------------|
|                                      | n      | %    | n      | %    |
| Age (years)                          |        |      |        |      |
| <20                                  | 28     | 1.0  | 155    | 5.5  |
| 21-30                                | 177    | 6.6  | 508    | 18.2 |
| 31-40                                | 449    | 16.6 | 424    | 15.2 |
| 41-50                                | 800    | 29.6 | 372    | 13.3 |
| 51-60                                | 839    | 31.1 | 612    | 21.9 |
| >60                                  | 408    | 15.1 | 724    | 25.9 |
| Sex                                  |        |      |        |      |
| Female                               | 1808   | 66.9 | 1651   | 59.1 |
| Male                                 | 893    | 33.1 | 1142   | 40.9 |
| Place of living                      |        |      |        |      |
| City                                 | 1870   | 69.3 | 1636   | 58.6 |
| Countryside                          | 827    | 30.7 | 1156   | 41.4 |
| Marital status                       |        |      |        |      |
| Single                               | 280    | 10.4 | 486    | 17.4 |
| Married                              | 1264   | 46.8 | 1716   | 61.5 |
| Divorced                             | 651    | 24.1 | 188    | 6.7  |
| Widow/widower                        | 507    | 18.8 | 401    | 14.4 |
| Education                            |        |      |        |      |
| Primary school/vocational            | 964    | 35.8 | 1225   | 44.0 |
| High school                          | 1283   | 47.6 | 1109   | 39.9 |
| University education                 | 449    | 16.7 | 447    | 16.1 |
| Employment                           |        |      |        |      |
| Unemployed                           | 156    | 5.8  | 482    | 17.3 |
| Temporary employment                 | 781    | 28.9 | 281    | 10.1 |
| Full-time                            | 1174   | 43.4 | 818    | 29.4 |
| Farmer                               | 69     | 2.6  | 136    | 4.9  |
| Pension/retirement                   | 522    | 19.3 | 1067   | 38.3 |
| Maintenance conditions               |        |      |        |      |
| Bad                                  | 35     | 1.3  | 72     | 2.6  |
| Average                              | 1129   | 41.9 | 1039   | 37.4 |
| Satisfactory                         | 1295   | 48.0 | 1242   | 44.7 |
| Very good                            | 238    | 8.8  | 428    | 15.4 |
| Living conditions                    |        |      |        |      |
| No flat                              | 23     | 0.9  | 34     | 1.2  |
| Multi-family house                   | 1613   | 59.7 | 1241   | 44.5 |
| House                                | 1065   | 39.4 | 1516   | 54.3 |
| Toilet in the flat                   |        |      |        |      |
| No toilet and bathroom               | 63     | 2.3  | 100    | 3.6  |
| Access to toilet only                | 507    | 18.8 | 152    | 5.4  |
| Toilet and bathroom in the flat/house| 2131   | 78.9 | 2540   | 91.0 |
| Which hospital stay                  |        |      |        |      |
| First                                | 529    | 19.6 | 768    | 27.5 |
| Second                               | 1294   | 47.9 | 662    | 23.7 |
| Third or more                        | 878    | 32.5 | 1358   | 48.7 |
| Why this hospital                    |        |      |        |      |
| Had no other choice                  | 682    | 25.2 | 475    | 17.0 |
| Wanted to get treatment at this hospital| 813   | 30.1 | 475    | 17.0 |
| Hospital is closest to the place of living | 1207 | 44.7 | 1838   | 65.9 |
| Mode of admission                    |        |      |        |      |
| Ambulance                            | 501    | 18.5 | 391    | 14.0 |
| Stand-alone application              | 264    | 9.8  | 447    | 16.0 |
| Doctor’s referral                    | 1936   | 71.7 | 1957   | 70.0 |
volunteered between August 8, 2008, and June 30, 2009). It took 2 years to collect all questionnaires—1 year before and 1 year after the transition. Patients were asked on the last day of their hospitalization and completed the anonymous survey completely voluntarily. Urns were placed in the hospital, where patients could place their filled questionnaires that had previously been included in the pilot study, where the responsiveness and understanding of the questions were assessed.

The survey included 5497 patients: 2702 before and 2795 patients after the hospital’s transition. The first stage comprised of a comparison of the population of respondents before and after the hospital’s transition. All of the evaluated elements of the characteristic that differentiated the studied populations are shown in Table 1.

### Description of Research Tools

The survey concerning satisfaction among the patients was carried out using an anonymous survey that included 46 questions. The questions were grouped into four thematic domains: 1—evaluation of doctors’ work, 2—evaluation of nurses’ work and the assisting personnel, 3—evaluation of personnel organization and information provided to patients, and 4—evaluation of housing conditions and board. The survey also included questions concerning socio-demographic data and questions concerning social living conditions of the patients. The respondents assessed the functioning of the admission center and hospital wards using a 4-degree scale of evaluation (2 = negative, 3 = average, 4 = good, 5 = very good). Arithmetic means of evaluation of the admission center and hospital wards in individual domains were included as well as global evaluation of all the questions assessing the admission center and the hospital wards.

### Methods of Statistical Analysis

For statistical analysis of the collected empirical material, a multivariate analysis of variance (MANOVA) was used. The time of evaluation of the functioning of the admission center and the hospital wards (prior vs. after the transition) as well as the type of ward was included into the model as dependent variables. Average evaluations in individual domains and global average evaluations of the functioning of the admission center and the hospital wards were included in the model as independent variables. Due to the skewed distribution of the variables determining the general average evaluation (see Figure 1) and the average evaluations in individual domains prior to be included in

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**Figure 1.** Histogram of the mean performance of departments before (left panel) and after (right panel) transformation.
Figure 2. Mean improvement in the assessment of hospital performance according to each domain.

### Table 2. Admission Performance: Before-After Comparisons in Each Domain.

| Domain | Before transformation mean | After transformation mean | M difference | 95% confidence interval |
|--------|---------------------------|--------------------------|--------------|------------------------|
| Domain 1 | 3.00 | 4.53 | 1.53 | 1.49 - 1.56 |
| Domain 2 | 3.17 | 4.56 | 1.39 | 1.36 - 1.42 |
| Domain 3 | 2.81 | 4.26 | 1.45 | 1.41 - 1.49 |
| Domain 4 | 2.95 | 4.38 | 1.43 | 1.39 - 1.46 |
| Total   | 3.02 | 4.46 | 1.44 | 1.41 - 1.46 |

*The model includes variables that describe difference between population studied before and after transformation.

*The model is corrected for multiple comparisons.

### Table 3. Hospital Departments Performance: Before-After Comparisons in Each Domain.

| Domain | Before transformation mean | After transformation mean | M difference | 95% confidence interval |
|--------|---------------------------|--------------------------|--------------|------------------------|
| Domain 1 | 3.04 | 4.40 | 1.36 | 1.32 - 1.40 |
| Domain 2 | 3.03 | 4.50 | 1.47 | 1.44 - 1.50 |
| Domain 3 | 2.95 | 4.28 | 1.33 | 1.30 - 1.36 |
| Domain 4 | 3.16 | 3.92 | 0.77 | 0.73 - 0.80 |
| Total   | 3.06 | 4.21 | 1.15 | 1.12 - 1.18 |

*The model includes variables that describe difference between populations studied before and after transformation.

*The model is corrected for multiple comparisons.

Results

In the chi-square test, all independent variables differed significantly between the populations of the respondents who were studied prior to and after the transition (for all independent variables, $P < .001$).

In the second stage, using the multifactorial ANOVA model, the analysis was carried out of the influence of the hospital’s transition on the change in the assessment of its functioning. In all domains, the evaluation of both the admission center and the hospital wards (see Tables 2 and 3, and Figure 2) was significantly higher among the respondents asked after the transition as opposed to their assessment prior to the transition of the institution. Average values prior to and after the transition as well as average values of the improvement in individual domains are presented in Tables 2 and 3. The multifactorial ANOVA made it possible to estimate the average values including the influence of a different characteristic of the studied populations prior to and after the transition and including the correction for the multiple comparisons in individual domains. While comparing both populations, the greatest improvement in the functioning of the admission center after the transition was noted in Domain 1 (assessment of the work of doctors) and the lowest level of improvement was observed in Domain 2 (assessment of the work of nurses). The greatest improvement in the functioning of the hospital wards after the transition was observed in Domain 2 (assessment of the work of nurses) whereas the lowest level of improvement was noted in Domain 4 (assessment of the housing conditions and board). The general improvement in the assessment of the functioning of the admission center was significantly higher when contrasted with the general improvement of the assessment of the functioning of the hospital wards. For each domain and for total effect, $P$ levels were <.0001.

The multifactorial ANOVA model presented interaction between the dependent variables ($P < .0001$), which point out to significant differences between the hospital wards in their influence of the transition on the patients’ opinion concerning their functioning (see Figure 3).
The greatest improvement in the evaluation of the functioning was observed for the ward of infectious diseases and the lowest level of improvement was noted for the maternity ward. The lowest level of improvement for all wards was noted for Domain 4 (assessment of housing conditions and board).

**Discussion**

In the context of a hospital transition, it is of essence to obtain feedback from patients of such an institution that would concern the quality of the services provided.\(^{12,13}\)

The presented results show clearly that transforming this hospital led to the improvement in the opinion of its patients about its functioning. Both the opinions of patients about the hospital personnel work and the housing conditions were better. In addition, significant differences as for the improvement of opinion of the respondents were noted concerning both the admission center and individual hospital wards. The lowest level of improvement in the opinion of patients was noted in the area of housing conditions of the hospital. Both prior to and after the transition, the organization of work of the personnel and informing the patients were assessed low. The study enables to introduce changes, aiming at improvement of the relationship between the institution and its patients, and further provides a constant number of patients who are aware of a high level of the provided services that are also adjusted to the needs these patients have.

A similar study of satisfaction among patients was carried out at a district hospital in Brzeziny.\(^{17}\) The results showed that patients assessed the wards positively for all medical services (60% of the respondents voted for very good or good). Thanks to the studies, there was a restructure in the number of hospital beds, and the wards were additionally equipped with specialized medical equipment that helped shorten a patient’s stay in hospital. Patients expressed their dissatisfaction with the time of waiting for a hospital bed, information provided by doctors (concerning the therapy and the treatments), and the quality of meals.

![Figure 3. Mean improvement in the assessment of hospital performance according to the hospital department.](image-url)

*ENT=* ear-nose-throat.
In summary, a proper direction of the hospital’s transition may lead to the improvement of the patients’ opinion about its functioning. The differences between the discussed issues as well as the differences in the opinion of individual hospital wards and the admission center suggest the need to implement individual plans of transformation.

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