APPLYING OF DYSCRYMINATORY MODELS UNDER EXAMINATION THE QUALITY OF MEDICAL SERVICES IN POLAND

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Summary: It was showed in the article that the execution quality and the level of service at hospitals is the effect of the behaviour oneself of personnel in given peculiar situation.

INTRODUCTION

With the modern world's concern about competition, the quality of health care became one of the major issues. Modern organizations, regardless of the type of activity that they are involved in, should encourage the improvement of health care, because the quality is becoming grounds for effective lead of the activity the factor of market success, but also clients' satisfaction at provided services. Quality of health care is not only a factor of market success, but also a determining factor which pertains to the type of culture present in the organization. Quality understood as something, which it is possible to adjust [1], entered in the sector of the health care too within a few last years. The change of the act on centers of health care, the reform of health insurance [1], and facilities, the use of tools such as ISO standards entering the Polish market, the cost of quality care, and accreditation applications forced this situation.

The quality is currently the basic factor deciding about the level of client/patient satisfaction and the same about success of the company [2]. The concept of the quality [2, 3, 4] of medical services is very difficult for unambiguous defining. It is possible to tell, that quality of health care is:

- Level, in which the service is providing the patient needs.
- Level, in which the class of the service has the potential ability to secure the satisfaction for the patient.
- This kind of maintenance, in which the patient's measurable good is being maximized taking under remark the balance anticipated benefits and losses accompanying the process of maintenance in all of his stages.

METHODOLOGY OF EXAMINATIONS AND CHARACTERISTICS OF THE TEST OBJECT

A group of 60 hospitals possessing first, second and third level of the reference was embraced by the examinations. The discriminatory analysis consists in the estimation of each endogenous variables, made behind help p-fractiles [5]. The attempt is combining in the dissertation from two p-sizes attempt of normal distribution about vectors of the anticipated value X_1 and X_2 and the same matrix covariance's S. For example at setting two variables together the discriminatory [6] function will be a'x, where for a vector were accepted vector maximizing the expression:

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$$t^2(a) = \frac{[a'(\overline{x}_1 - \overline{x}_2)]^2 \frac{N_1 N_2}{N_1 + N_2}}{a'Sa} \tag{1}$$

Where: a – vector of the discriminatory function parameters, N - number of i- groups.
a'Sa = 1
A vector is the solution to the homogeneous system of equations:

$$[\frac{N_1 N_2}{N_1 + N_2}(\overline{x}_1 - \overline{x}_2)(\overline{x}_1 - \overline{x}_2)' - \lambda S]a = 0 \tag{2}$$

Where:

$$\lambda = \max_a t^2(a) = \frac{N_1 N_2}{N_1 + N_2}(\overline{x}_1 - \overline{x}_2)'S^{-1}(\overline{x}_1 - \overline{x}_2) = T^2 \tag{3}$$

the matrix row this setup is equal to p - 1 that is assigning the occurring form to the linear discriminatory function:

$$y = (\overline{x}_1 - \overline{x}_2)'S^{-1}x \tag{4}$$

The next stage consists in the estimation of the discriminatory function with reference to the comparable variance of watched variables. The discriminating point is:

$$populacjaA < (\overline{x}_1 - \overline{x}_2)'S^{-1}(\overline{x}_1 - \overline{x}_2) \leq populacjaB \tag{5}$$

As the criterion (critical value) Anderson's classificatory statistics was applied:

$$W = (\overline{x}_1 - \overline{x}_2)'S^{-1}x - 0,5 \bullet (\overline{x}_1 - \overline{x}_2)'S^{-1}(\overline{x}_1 + \overline{x}_2) \tag{6}$$

Where: x classified to the population 1 (about the weak innovative activity) when W < 0, and to 2 populations (about the high innovative activity) when W > 0. A number of resources being located in each test objects, deciding on the quality level of the medical services was accepted as the criterion (doctors' number, nurses' number, the beds' number…). An estimation was accepted (1), when the given feature is engaging the value bigger than Q_1; estimation (2), when the given feature is accepting the bigger than Q_1 and not bigger than Me value; estimation (3), when the given feature is engaging the bigger than Me and not bigger value than Q_3 and estimation (4) when the given feature is accepting value bigger than Q_3.

Parameters of the discriminatory function were assigned on the basis of these estimations and then coefficients of accuracy (utilizing simple simulations) were determined. Four models were constructed of the discriminatory function application. One model is referring to the client/patient on the basis of the Servqual method [7, 8, 9, 10]. Three remaining are behaving towards personnel according to the Servqual method. In the table 1 effects of the linear discriminatory model application were presented.

Table 1. An example of model occurs as a result of discriminatory function applying

Endogenous variable	Explanatory variables / estimations of the discriminatory function parameters				Critical point	Coefficient of accuracy	Analogous R^2
Y_{KS15}	X_2	X_3	X_6	X_{14}			
	-0,052	-0,049	0,0000424	0,233	0,331	0,617	0,090

Source: Own study at applying the STATISTICA™PL

where:
 Y_{KS15} - econometric model referring to the client/patient on the basis of the Servqual method,
 Y_{S14}, Y_{S18} - econometric model referring to personnel on the basis of the Servqual method.

$$\mathbf{Y_{KS15}= - 0,052X_2 - 0,049X_3 + 0,0000424X_6 + 0,233X_{14}} \tag{7}$$

Personnel's responsibility is the next endogenous variable that in patients' estimation is dependent from: nurses' number, number of operations carried out laparoscope's, numbers of operations carried out on the casualty ward and numbers of operations carried out. Client/patient is feeling the satisfaction from quality provided medical services when nurses' number is smallest (what is being bound probably from "with blur" ordering the responsibility in the case of the too numerous crew of the structure), number of operations carried out laparoscope's isn't exceeding 143 (it is possible to carry the so much operation out effectively in this system), however, the number of the operation carried out and numbers of operations carried out on the casualty ward should be higher from 2728 (what is pointing realizations the involvement of the hospital of needs following from the side of sick people).

SUMMARY

Results of examinations and their analysis showed that the intensity of workers engagement personality of workers employed in the occur services image is the most important in the hospital activity. It was stated that the health care organizations in order to surviving on the competitive market have to engage qualified workers to manage the organization and its organizational components.

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