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TITLE PAGE

TITLE OF MANUSCRIPT

Humanization in the Emergency Department of an Italian hospital: new features and patient satisfaction.

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CONFLICTS OF INTEREST

The authors declare that they have no financial or other conflicts of interest related to the submission.

ABSTRACT

Objectives

Goal of this study was to describe and analyze interventions performed in the emergency department of an Italian hospital aimed to humanize the patient care pathway. This paper is divided into two parts: in the first, we describe the actions that were taken; in the second, we analyze whether these changes resulted in an increased level of patient satisfaction.

Methods

We carried out an observational study that was conducted between October 2010 and March 2011. The data were collected through a telephone questionnaire administered to patients who were admitted to the ED before and after humanization interventions. The respondents were questioned about their general condition and their level of satisfaction.

Results

The study population included 297 patients (158 before and 139 after the interventions). We found that the highest overall patient satisfaction after the interventions was highly correlated with the humanization interventions and not to other factors, such as gender, age, educational level or the severity code triage. Specifically, in the patients who went to the ED after the changes had been made, we found a greater level of satisfaction regarding the comfort in the waiting room, the waiting time for the first visit, and the privacy experienced during the triage.

Conclusion

The results demonstrate that the interventions implemented in this study, designed to humanize the emergency department, have improved overall patient satisfaction.

Interventions may be taken to reduce the depersonalization of patients in the emergency room. Future efforts should be directed toward developing training programs for staff.

MAIN TEXT

INTRODUCTION

In recent years, the levels of medical assistance and hospital care have improved as a result of technological performance improvements in diagnostics and treatment. However, care pathway fragmentation, the increase in medical specialists, and the lack, at least in Italy, of a “care manager” have led to the depersonalization of patients. These issues are greater in the emergency department (ED) due to the services provided,[1].

In the current global financial crisis, quality is a critical factor for the survival of health care facilities. Although every effort is aimed at reducing costs and increasing the number of procedures performed, the risk of losing the centrality of the patient as a “human” is high.

Since the 1990s, the research interest in clinical practice quality assessment has continuously grown,[2,3]. The concept of “customer satisfaction” (or “patient satisfaction”) is a serious issue in health care and must be placed in the context of overall quality improvement,[4].

As described in the literature, satisfaction occurs when the services rendered meet the expectations, needs and perceptions of the patient,[5-8].

Over the past 20 years, there has been a surge in the published emergency medicine literature regarding patient satisfaction,[4,5]. However, the authors constantly emphasize the difficulty of accurately measuring patient satisfaction because it may be influenced by perception, the interpretation of events or clinical conditions,[1]. In recent years, much attention has been given to the concept of humanization of health care. The process of humanization is not only associated with medical services for diagnostics and

treatment but involves all aspects of the care process, such as logistics, environment, food, waiting times, and communication,[9].

However, little attention has been given to the concept of "humanization" in international medical publications because the literature is more focused on the concept of "patient satisfaction", even though the two concepts are connected.

The ED is considered the gateway to patient treatment,[10] and according to the literature,[5] the number of ED patients is steadily increasing. Because the ED is at the greatest risk of depersonalization or “de-humanization”, patient satisfaction is one of the most salient indicators of the quality of care provided in this setting.

Few studies have compared the level of satisfaction perceived by patients before and after an ED humanization intervention,[11-15] and most of the studies have focused on a specific intervention. For example, Kologlu,[12] and Krishel,[13] discussed the results of an improvement intervention, namely, the distribution of an information form; Corbett,[14] discussed an informational videotape; and George,[15] discussed an informal prioritization process for waiting times.

Other studies have suggested that patients' overall perception of care appeared to be associated with the humanistic attitude and technical competencies of the professionals, the perceived waiting time, the perceived total time spent in the ED, and the amount of information provided to the patients,[7,11,16]. However, there are other factors associated with patient satisfaction that are difficult to evaluate, such as privacy, cleanliness, safety, and low noise levels in patient rooms,[4].

In this context, “humanization”, “ethics” and “quality” are interdependent.

Despite the high incidence of ED use, in Italy only a few examples of the humanization process can be enumerated. Furthermore, most of these example are associated with

patients with a specific pathology Most of them have been carried out on specific pathology,[17,18].

The aims of this paper are to describe the interventions implemented in the ED by a regional Italian hospital for the purpose of humanizing the care pathway and to analyze whether the changes resulted in an increased level of perceived patient satisfaction.

METHODS

An observational longitudinal before and after study was conducted to evaluate patient satisfaction levels,[19] after a series of structural and organizational changes were applied in an ED. The study was authorized by the Health Department staff.

The study was carried out from October 2010 to March 2011 in the Emergency Department of Rivoli Hospital located in the Turin urban area.

The study population included all patients who were admitted to the emergency room during October, November and December 2010 (before the “humanization” interventions) as well as during January, February and March 2011 (after the “humanization” interventions). To select patients for this study, we chose two days of the week and contacted all of the patients who had been admitted to the ED during those specific days. Saturday and Wednesday were chosen to represent the holidays and work days, respectively. The exclusion criterion was being admitted with a triage “Red Code” due to the admission details that characterized these patients, such as the urgency of their conditions. The study population was divided into two sub-groups: the first group, called “Before”, included those patients who were admitted to the ED before the implementation of the changes described above; and the second group, called "After",

consisted of those who went to PS after the changes had been implemented. The inclusion criteria ensured the comparability of the groups.

In order to humanize the care pathway, we studied and performed structural and organizational changes to improve the ED area.

The structural and organizational interventions that were implemented are described below.

- *Introduction of a new triage “silver code”*. In Italy, a four-level triage system is used. Each level indicates a different degree of emergency and is represented by a color (in ascending emergency order: white, green, yellow and red). The “silver code” is a priority green code assigned to elderly patients (over 70 years old) with certain clinic characteristics to ensure shorter waiting times,[20]. Table 1 shows the changes that were implemented for the triage process.

The new scheme was developed by comparing internationally validated and approved rating scales,[21].

Table 1: Scheme of the triage process			
Age > 85 years	Code automatically: SILVER CODE		
Age > 70 years	If any two of the following criteria are met	Living alone	Code: SILVER CODE
		Difficulty walking / falls	
		Hospitalization in the last 30 days	
		Use of 5 or more medications	

		Suspected of - abuse - noncompliance of medications - substance abuse - problems in ADL, IADL	
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- Review of criteria for pediatric triage

A multidisciplinary working group established new standards and pathways for pediatric triage to ensure pediatric patient care pathway uniformity, less resource utilization and more rational pathways to meet the patient needs.

Before the changes were implemented each pediatric patient was managed directly by the pediatric department without an ED visit. In Table 2, the new pathways are shown.

Table 2: New criteria for pediatric triage in Rivoli Hospital		
Evaluation criteria	Possible clinical pathway	
Age < 3 years	Physician accepting	Pediatrician
Age > 3 years	Physician accepting	Pediatrics if experiencing general symptoms
		Surgery if wounds or trauma to the abdomen or chest
		Orthopedics if non-traumatic osteoarticular pathology or trauma of the limbs
		Intensivists if a red or yellow code, wounds, or trauma to the abdomen or chest

- *Create a new triage room with a dedicated nurse.* To accelerate and streamline triage operations, a new position, namely, a “welcoming manager” with management and patient sorting skills, was defined.

The dedicate nurse is the professional reference for a patient and his/her family. The dedicate nurse accommodates the patients and provides them with information concerning the care pathways in the emergency department. The dedicate nurse manages the patients’ needs, paying particular attention to any patient pain; provides news and information regarding patient care; and coordinates the activities of the operators and volunteers.

- *Improvement of the waiting room.* The waiting rooms were improved by renovating the design (or layout) of facility spaces, and increasing the number of facilities,[22].

- *Creation of a waiting room specifically for pediatric patients.* A pediatric patient waiting room was furnished according to the needs of this age group.

- *Introduction of volunteers.* Volunteers facilitate communication and improve the patient waiting experience. As part of the organizational changes described in this study, the role of volunteers was considered from the beginning of the study to be an essential component of the humanization process. In the early stages of the project, it was decided to clearly define their roles and the assigned tasks. Volunteer staff training was ensured by developing a course that was organized by the hospital.

As in other published studies, an observational longitudinal before and after study was conducted,[19].

A questionnaire was administered through a telephone interview and conducted by medical professionals,[5,23]. The questionnaire was first tested in a pilot study on 30 individuals who were excluded from the final study.

The patients were contacted by telephone, and their interview participation was voluntary. Patients gave their consent to the study verbally.

The questionnaire, was designed to measure overall patient satisfaction and assess at an individual level the different aspects of satisfaction. In addition, patient demographic information (age, sex, and educational level) and other information (admission time to the ED, triage code and previous ED admissions) were included.

A descriptive analysis of the study population, including patient demographic information (age, sex, and educational level) and other information (admission time to the ED, triage code, and previous ED admissions) was performed to verify the two groups' comparability.

A multinomial logistic regression was performed to identify the potential predictors of the differences in the distribution among the three classes of patient satisfaction (poor, medium, and high). We developed several bivariate models and identified variables that were significantly associated with the outcome at a 5% level. We included these variables in the multinomial regression analysis. In the final model, the variables were group, age class, gender and education. The final model estimates for each of the variables were adjusted, by controlling for the other variables. A two-tailed p-value of 0.05 was considered significant for all analyses, which were carried out using Stata, version 11.

RESULTS

We interviewed 297 patients between the ages of 16 and 86 years. The population was composed of 147 men (49.%) and 150 women (50.5%) who voluntarily responded to the interview between October 2010 and March 2011.

The "Before" group was composed of 158 patients: 75 males (47.5%) and 83 females (52.5%). The "After" group was composed of 139 patients: 72 males (51.8%) and 67 females (48.2%) (p=0.45).

The mean age of the participants was 48 years in both groups. The standard deviation (SD) was 13.7 in the "Before" group and 16.6 in the "After" group. The age categories most represented are 16-45 years and 46-65 years.

No statistically significant differences in the educational levels between the two groups were found. Of the ED patients with a Green Code, 72.6% were in the "Before" group, and 68% were in the "After" group. We excluded patients with a Red Code due to the urgency of their condition.

Following the implementation of organizational or structural changes, ten patients were identified with the Silver Code.

The "Before" and "After" groups were not significantly different with regard to gender (p=0.45), education (p=0.06), age (p=0.65) and triage code (p=0.73), thereby rendering them comparable (Table 3).

		"Before" Group	"After" Group	P-value
		N (%)	N (%)	
Gender	Male	75 (47.5)	72 (51.8)	0.45
	Female	83 (52.5)	67 (48.2)	
Mean Age	Mean (DS)	48.41 (13.75)	48.71 (16.60)	0.65
Age Group	16-45	66 (44.6)	55 (39.9)	0.14
	46-65	67 (45.3)	58 (42)	
	>66	15 (10.1)	25 (18.1)	
Education	Primary	31 (19.6)	17 (12.6)	0.06
	Middle school	54 (34.1)	45 (33.5)	
	High school	49 (31.0)	59 (44.0)	
	College graduate	24 (15.1)	13 (9.7)	

Triage Code	White	10 (7.4)	8 (8.0)	0.73
	Green	98 (72.6)	68 (68)	
	Yellow	27 (20.0)	24 (24.0)	
	Silver Code introduced in the “After” group and used in 10 patients.			

We then investigated the perceived satisfaction level before and after the ED modifications. Each respondent gave a rating from 1 to 10 in each of the following categories: the first impression of the ED, adequacy of the signage, comfort level in the waiting room, presence and availability of the staff, waiting time for the first visit, clarity of the information received, volunteer activities, discretion during triage and overall opinion.

Initially, we estimated the range of the average satisfaction level by group (Figure 1).

The perceived satisfaction level was slightly greater in the "After" group for the following categories: comfort level in the waiting room, waiting time for the first visit, clarity of the information received, discretion during triage, and overall opinion. In contrast, the overall average rating in the “After” group was slightly lower for the following categories: first impression of the ED, adequacy of signage and presence and availability of staff.

In agreement with other studies,[24] the individual scores were grouped into three levels:

- “poor” satisfaction, grades 1 to 4;
- “fair” satisfaction, grades 5 to 7;
- “good” satisfaction, grades 8 to 10.

The relationship between the level of perceived patient satisfaction and the humanization intervention is summarized in Table 4.

Table 4: Categories of patient satisfaction before and after the humanization intervention

	"Before" Group			"After" Group			P value
	N (%)			N (%)			
	Poor	Fair	Good	Poor	Fair	Good	
First impression of the ED	12 (7.6)	95 (60.1)	51 (32.3)	32 (23.0)	94 (67.6)	13 (9.4)	0.000
Adequacy of signage	12 (7.6)	102 (64.6)	44 (27.8)	24 (17.3)	88 (63.3)	27 (19.4)	0.019
Level of comfort in the waiting room	30 (19)	96 (60.8)	32 (20.2)	33 (21.2)	75 (54)	31 (49.2)	0.46
Presence and availability of staff	12 (7.6)	73 (46.2)	73 (46.2)	18 (13)	90 (64.7)	31 (22.3)	0.000
Waiting time for first visit	69 (43.7)	65 (41.1)	24 (15.2)	27 (19.4)	76 (54.7)	36 (25.9)	0.000
Clarity of information received	19 (12)	102 (64.6)	37 (23.4)	16 (11.5)	83 (59.7)	40 (28.8)	0.57
Volunteer activities	-	-	-	1 (0.72)	78 (56.1)	60 (43.1)	
Discretion during triage	13 (8.2)	116 (73.4)	29 (18.3)	15 (10.8)	83 (59.7)	41 (29.5)	0.03
Overall opinion	35 (22.2)	99 (62.6)	24 (15.2)	7 (5)	112 (80.6)	20 (14.4)	0.000

We considered the respondents' level of satisfaction for each category and compared the responses of the two groups. The satisfaction ratings of the two patient groups differed in the following categories: first impression of the ED (p=0.000), adequacy of signage (p=0.019), presence and availability of the staff (p=0.000), waiting time for the first visit (p=0.000), discretion during triage (p=0.03) and overall opinion (p=0.000).

The patients in the "After" group showed greater satisfaction in the following categories: waiting time for the first visit, clarity of information received, discretion during triage and overall opinion of the ED.

In contrast, the patients in the "After" group appeared to perceive a lower satisfaction in the following categories: first impression of the ED, adequacy of signage, and presence and availability of the staff. Of the patients admitted before the structural and organizational changes were implemented, 60.1% reported a fair first impression of the ED, and 32.3% had a good opinion. In the "After" group, 67.6% had a fair opinion of the ED, and only 9.4% had a good first impression of the ED (p=0.000).

Of the “Before” group patients, 7.6% had a negative opinion regarding the adequacy of the signage and this percentage rose to 17.3% in the “After” group ($p=0.019$). Similar results emerged for the “presence and availability of the staff”, namely, fair/good evaluations were given by 92.4% of the patients in the “Before” group and 87% of the patients in the “After” group ($p=0.000$). We did not find any statistical differences between the “level of comfort in the waiting room” ($p=0.46$) and the “clarity of information received” ($p=0.57$).

The descriptive analysis revealed an improvement in the overall patient opinion of the ED resulting from the organizational and structural changes that were implemented. Therefore, we specifically analyzed these data using a multivariate analysis to investigate which factors affected the overall patient opinion. We chose as the dependent variable the “overall good opinion”.

Table 5 shows that the categories significantly associated with an overall good opinion of the ED ($p<0,05$) are level of comfort in the waiting room, waiting time for the first visit and discretion during triage. All of these variables had a positive effect on patient satisfaction while the first impression of the ED had a negative effect.

Table 5: Satisfaction categories that determine high overall patient satisfaction

		OR	P-value	IC 95%
First impression of the ED	Poor	1	-	-
	Fair	0.88	0.002	0.18 – 0.42
	Good	0.38	0.28	0.66 – 2.19
Adequacy of signage	Poor	1	-	-
	Fair	1.13	0.88	0.21 – 6.02
	Good	0.67	0.68	0.09 – 4.71
Level of comfort in the waiting room	Poor	1	-	-
	Fair	6.24	0.03	1.14 – 34.02
	Good	1.74	0.68	0.20 – 14.59
Presence and availability of staff	Poor	1	-	-
	Fair	0.22	0.11	0.03 – 1.42
	Good	1.29	0.8	0.17 – 9.8

Waiting time for first visit	Poor	1	-	-
	Fair	12.76	0.009	1.87 – 86.83
	Good	25.79	0.002	3.38 – 196.54
Clarity of information received	Poor	1	-	-
	Fair	0.16	0.06	0.02 – 1.13
	Good	0.36	0.33	0.046 – 2.84
Discretion during triage	Poor	1	-	-
	Fair	2.66	0.44	0.21 – 32.65
	Good	15.84	0.03	1.23 – 203.6

A multinomial logistic regression was performed to identify the potential predictors of the differences in the score distributions among the three classes of patient satisfaction.

Table 6 shows that the “After” group had a greater level of satisfaction compared with the “Before” group regarding overall opinion of the ED. In particular, by comparing the “overall opinion” scores in the two groups, we found that the “After” group had a higher probability of having an opinion of "fair" (regression coefficient of 1.50, $p=0.001$) or "good" (regression coefficient 1.17 and $p=0.031$) compared with the probability of an overall opinion of "poor" (Table 6).

Table 6. Results of the multinomial logistic regression evaluating potential predictors of the overall opinion of the ED. in the “Before” and “After” groups (dependent variable: overall opinion)

Overall Opinion of the ED (Scale)	Regression coefficient	(95% CI)	p
Fair vs. Poor satisfaction			
“After” group	1.50	(0.61 – 2.39)	0.001
Age class			
16-45	-	-	-
46-65	0.23	(-0.60 – 1.06)	0.58
>66	1.22	(-0.41 – 2.85)	0.14
Gender: Male	0.12	(-0.65 – 0.89)	0.76
Education			
Primary	-	-	-
Middle school	0.32	(-0.86 – 1.49)	0.60
High school	0.30	(-0.86 – 1.47)	0.60
College graduate	0.41	(-1.02 – 1.83)	0.57

Good vs. Poor satisfaction			
“After” group	1.17	(0.11 – 2.23)	0.03
Age class			
16-45	-	-	-
46-65	0.23	(-0.80 – 1.26)	0.66
>66	0.42	(-1.52 – 2.36)	0.67
Gender: Male	0.94	(-0.02 – 1.90)	0.06
Education			
Primary	-	-	-
Middle school	0.04	(-1.38 – 1.46)	0.95
High school	-0.43	(-1.88 – 1.01)	0.56
College graduate	0.22	(-1.49 – 1.94)	0.80

DISCUSSION

For the first time in Italy, a study has been conducted to describe a variety of significant structural and organizational changes implemented in the ED and to investigate how these changes are perceived by patients. The international literature is primarily focused on "patient satisfaction", but there are a small number of recent studies that have described and studied structural and organizational changes in the ED. Moreover, these studies have referred to individual actions (i.e., structural or organizational),[13] and hardly investigated the level of satisfaction perceived by the users,[14] related to these actions. The active approach of this study, which included a practice intervention, in combination with the evaluation of the consequences of the interventions, is a major strength of this study.

To choose the best interventions in the emergency room, we performed a literature review and identified the most critical areas for both "depersonalization", patient satisfaction, and hospital organization. Based on other published studies, we performed this study in the emergency department.

In accordance with other publications, telephone interviews were performed in this study,[23]. During the waiting time in the emergency department, responses could have

been affected by the user's state of mind or their health condition, particularly if the patient was unable to have an unbiased perspective.

However, the telephone survey method resulted in a lower response rate than face-to-face interviews but a higher rate than e-mail interviews,[5].

The main result of this study is an increased level of overall satisfaction after the changes in the ED. The elements found to most affect overall patient satisfaction were the level of comfort in the waiting room, waiting time for the first visit and discretion during triage. In agreement with other studies, we found that the perceived waiting time is a significant factor in satisfaction,[5,6]. Previous studies showed that patients who receive information concerning their medical care and the reasons why they are waiting reported much higher levels of satisfaction than others who do not receive this information,[16]. The findings of the present study demonstrate that “discretion during triage” is important in patient satisfaction but not the “clarity of information received”.

We found a statistically significant decrease in the level of satisfaction from the "Before" group to the "After" group regarding the first impression of the ED ($p=0.000$), the adequacy of signage ($p=0.019$) and the presence and availability of staff ($p=0.000$). The “first impression of the ED” and “adequacy of signage” can be explained by considering that the interventions mentioned in this paper are part of the overall hospital restructuring. Therefore, the “After” group visited the hospital when different areas were incomplete or undergoing construction.

Regarding the presence and availability of the staff, it may be appropriate to separate "presence" from "availability" in any related analyses because the "presence/number of workers" is an objective parameter, whereas the "availability" is a personal assessment.

Therefore, this result should be reassessed with a larger study population and a greater number of observation days.

Moreover, in the future, we should organize staff training courses to teach the staff humanization principles and involve them in the reorganization pathway.

Some weaknesses of the study have been identified. In particular, the actual waiting time for each patient, the reason for patient admission,[8] and the presence of pain were not evaluated. In fact, this information may affect the patient satisfaction level, as reported by other authors,[10].

Further limitations of the study are the low sample size, the lack of staff training programs concerning the “humanization” concept.

We can conclude that, for the first time, our study demonstrates that interventions designed to humanize the ED have a real and measurable effectiveness and increase overall patient satisfaction.

REFERENCES

1. Mack JL, File KM, Horwitz JE et al. The effect of urgency on patient satisfaction and future emergency department choice. *Health Care Manage Rev.* 1995; 20(2):7-15.
2. Carpenter CR, Heard K, Wilber S et al. Society for Academic Emergency Medicine (SAEM) Geriatric Task Force. Research priorities for high-quality geriatric emergency care: medication management, screening, and prevention and functional assessment. *Acad Emerg Med.* 2011; 18(6):644-54.
3. Pines JM, Asplin BR. Systems Approach Conference Panelists. Conference proceedings-improving the quality and efficiency of emergency care across the continuum: a systems approach. *Acad Emerg Med.* 2011; 18(6):655-61.
4. Welch SJ. Twenty years of patient satisfaction research applied to the emergency department: a qualitative review. *Am J Med Qual.* 2010; 25(1):64-72.
5. Trout A, Magnusson AR, Hedges JR. Patient satisfaction investigations and the emergency department: what does the literature say? *Acad Emerg Med.* 2000; 7(6):695-709.
6. Thompson DA, Yarnold PR, Williams DR et al. Effects of actual waiting time, perceived waiting time, information delivery, and expressive quality on patient satisfaction in the emergency department. *Ann Emerg Med.* 1996; 28(6):657-65.
7. Thompson DA, Yarnold PR, Adams SL et al. How accurate are waiting time perceptions of patients in the emergency department? *Ann Emerg Med.* 1996; 28(6):652-6.
8. Topacoglu H, Karcioğlu O, Ozucelik N et al. Analysis of factors affecting satisfaction in the emergency department: a survey of 1019 patients. *Adv Ther.* 2004; 21(6):380-8.

9. Booth AJ, Harrison CJ, Gardener GJ et al. Waiting times and patient satisfaction in the accident and emergency department. *Arch Emerg Med.* 1992; 9(2):162-8.
10. Soleimanpour H, Gholipouri C, Salarilak S et al. Emergency department patient satisfaction survey in Imam Reza Hospital, Tabriz, Iran. *Int J Emerg Med.* 2011; 4:2.
11. Tran TP, Schutte WP, Muelleman RL et al. Provision of clinically based information improves patients' perceived length of stay and satisfaction with EP. *Am J Emerg Med.* 2002; 20(6):506-9.
12. Kologlu M, Agalar F, Cakmakci M. Emergency department information: does it effect patients' perception and satisfaction about the care given in an emergency department? *Eur J Emerg Med.* 1999; 6(3):245-8.
13. Krishel S, Baraff LJ. Effect of emergency department information on patient satisfaction. *Ann Emerg Med.* 1993; 22(3):568-72.
14. Corbett SW, White PD, Wittlake WA. Benefits of an informational videotape for emergency department patients. *Am J Emerg Med.* 2000; 18(1):67-71.
15. George S, Read S, Westlake L et al. Evaluation of nurse triage in a British accident and emergency department. *BMJ.* 1992; 304(6831):876-8.
16. Bjōrvell H, Stieg J. Patients' perceptions of the health care received in an emergency department. *Ann Emerg Med.* 1991; 20:734-8.
17. Ciprandi G, Incorvaia C, Scurati S et al. Patient-related factors in rhinitis and asthma: the satisfaction with allergy treatment survey. *Curr Med Res Opin.* 2011; 27(5):1005-11.
18. Boccanelli A. The hospital of tomorrow: between humanization and cost restraints. The case of cardiovascular diseases. *G Ital Cardiol (Rome).* 2011; 12(1):19-20.

19. McCarthy ML, Ding R, Zeger SL et al. A randomized controlled trial of the effect of service delivery information on patient satisfaction in an emergency department fast track. *Acad Emerg Med.* 2011; 18(7):674-85.
20. Di Bari M, Balzi D, Roberts AT et al. Prognostic stratification of older persons based on simple administrative data: development and validation of the "Silver Code," to be used in emergency department triage. *J Gerontol A Biol Sci Med Sci* 2010; 65(2):159-164
21. Storm-Versloot MN, Ubbink DT, Kappelhof J et al. Comparison of an informally structured triage system, the emergency severity index, and the manchester triage system to distinguish patient priority in the emergency department. *Acad Emerg Med.* 2011; 18(8):822-9.
22. Papa L, Seaberg D, Rees E et al. Does a waiting room video about what to expect during an emergency department visit improve patient satisfaction? *CJEM* 2008; 10(4):347:54
23. Bursch B, Beezy J, Shaw R. Emergency department satisfaction: what matters most? *Ann Emerg Med.* 1999; 22(3):586-91.
24. Bruce TA, Bowman JM, Brown ST. Factors that influence patient satisfaction in the emergency department. *J Nurs Care Qual* 1998; 13:31-7

Figure 1. Medium level of patient satisfaction before and after implementation of the changes in the ED.