

THE IMPACT OF NOSOCOMIAL INFECTIONS ON ORTHOPEDIC PATIENTS' QUALITY OF LIFE

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Abstract: The aim of the study was to measure the satisfaction of the orthopedic patient who suffers from nosocomial infections. We could not find in the literature a questionnaire to evaluate the satisfaction of patients who were admitted in an orthopaedic unit, suffering from a nosocomial infection. Therefore, we modified a model of MOS-SF36 questionnaire and added a few items referring to patient's knowledge about nosocomial infections and quality of life. 90% of patients reported pain, 81% immobility, 17.5% indifferent attitude of the medical staff and 81% mentioned depression as a factor for impaired quality of life. Concerning the implementation of good practice protocols, 95% of the medical staff wore gloves, only 60% washed their hands and only 7% were washing themselves properly after touching patients. The lack of implementation of good practice protocols corroborated with patient colonization and wards deprivation increase the risk of nosocomial infections and lower the quality of life and patient satisfaction.

INTRODUCTION

Every day, nosocomial infections cause prolonged hospitalization, long-term disability, increased resistance to microbial agents, high costs for the health systems, higher expenses for patients and their families and a high number of deaths.(1) Every year, nosocomial infections are accountable for more than 90 000 deaths worldwide.(1,2) The most common route of infection is the contaminated hand, so that in hospital facilities, hands hygiene is absolutely necessary after every procedure performed by the medical staff. It has been scientifically proven that properly hand-washing can significantly reduce the spread of microorganisms in hospital. Medical staff can contaminate their hands by doing simple procedures, by touching medical equipment or by the direct contact with the patient or his goods.(3,4) Due to the fact that quality has become a measure of performance for health units, their concerns for introducing quality assessment programmes have become more obvious.(5) The fundamental objective proposed by the Romanian Ministry of Health for hospital reform is to improve the quality of health care services to policy holders and efficient access to all groups of population, including those in need. In the current reform, health organization managers are increasingly preoccupied for higher standards of services provided by the institutions that they manage. Continuous quality improvement aims at increasing customer satisfaction and at reducing the costs for any service provided.(6,7)

PURPOSE

The aim of the study is to measure the satisfaction level of patients admitted in an orthopedic unit who are also suffering from a nosocomial infection.

MATERIALS AND METHODS

The study group is made up by the patients admitted in the orthopedic unit of the County Clinical Emergency

Hospital of Braşov, between 01.01.2011 and 31.12.2013, including a total number of 7 551 patients.

225 subjects were randomly chosen from 7 551 patients to achieve a thorough analysis concerning the knowledge, the needs of patients on the infections acquired as a result of the medical manoeuvres and on the skills of the medical staff from the orthopedic unit. 120 of them met the criteria for being included in the study and they answered our questionnaire.

Inclusion criteria were: patients admitted in the orthopedic unit; patient consent, patient over 18 years old, patients of sound mind.

Data collection was made according to the principles of medical ethics.

We did not find in the literature any standard questionnaire to assess the satisfaction level in the patients hospitalized in an orthopedic unit and suffering from a nosocomial infection. As part of the Medical Outcomes Study (MOS), it was developed the 36-Item Short Form Health Survey (SF-36) which is a set of generic, coherent, and easily administered quality-of-life measures. In this study, we aimed at developing a questionnaire based on the well known MOS-SF 36 questionnaire that is characteristic to orthopedic patients. We brought extra items referring to skills and knowledge about nosocomial infections. Assessment of impairment degree of quality of life was made based on our questionnaire with 43 questions. Each participant also received an "informed consent form".

These questionnaires investigate, on one hand the attitude of the healthcare professionals to wound management, the process of training and professional development, the risk of contamination, and on the other hand, they analyse the satisfaction level of the patients from the orthopedic unit. It assesses the quality of life denoted by a self-assessment scale from 0 to 100; the maximum fine state is denoted by 100 and the worst state 0.

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To remove any error factor that could influence the responses, in our study we chose to use self-administered questionnaires that have been designed specifically to be filled out by a respondent without the intervention of the researchers who were collecting the data.

We tried to measure both the patient and medical personnel risk behaviour for nosocomial infection.

Through the control questions, which do not bring new information, we tried to verify the fidelity of opinions.

RESULTS AND DISCUSSIONS

Quality of life was the key criteria in our study group examined alongside the microbiological laboratory examinations. Its evaluation was made after assessing the quality of life scale.

Statistical analysis of health status parameters showed that pain affects considerably the parameters of the daily activities and significantly reduces the quality of life.

Table no. 1. The average grade of wellbeing in the study group

| Group | | | | | |
|---------|-----------|---------|---------|----------|----------|
| Obs. | Total | | Mean | Variance | Std. Dev |
| 114 | 7582.0000 | | 66.5088 | 392.5707 | 19.8134 |
| Minimum | 25% | Median | 75% | Maximum | Mode |
| 2.0000 | 50.0000 | 70.0000 | 80.0000 | 100.0000 | 50.0000 |

From the subjects who reported locomotion deficits or were required to stay in bed, the average health status is 66.42, which shows an altered state. The average of nosocomial infection is 57.85, well below the state average of the study group (66.5).

90% of respondents reported pain, 81% immobility, 17.5% indifferent attitude of the medical staff and 81% mentioned depression as a factor for impaired quality of life (see table no. 2).

Table no. 2. The frequency of impaired quality of life

| Impaired quality of life | Frequency | Percent | 95% Conf Limits |
|--------------------------|-----------|---------|-----------------|
| Pain – discomfort | 108 | 90.0% | 65.4% 81.7% |
| Immobility | 97 | 80.9% | 54.9% 72.7% |
| Staff attitude | 21 | 17.5% | 15.9% 38.7% |
| Depression | 97 | 80.9% | 54.9% 72.7% |

Through our research, we tried to find out the patients' needs, especially of those from the orthopedic unit; for that, we included in our questionnaire an open question. The answers were helpful, patients accurately pointing out the unit's deficiencies: 21.5% lack of toilets in the ward, 7.5% wards overcrowding, 6% lack of information, poor communication with the medical staff, 10.5%, the lack of TV, radio, air conditioning or refrigerator, 15% poor cleaning, unchanged linen daily, 5% lack of crutches and strollers (table no. 3).

Table no. 3. Frequency of the needs expressed by the respondents

| Patients' needs | Frequency | Percent | 95% Conf Limits |
|--------------------------------|-----------|---------|-----------------|
| Access to toilet | 2 | 4.3% | 0.5% 14.5% |
| Air conditioning | 1 | 2.1% | 0.1% 11.3% |
| Crutches | 1 | 2.1% | 0.1% 11.3% |
| Strollers | 1 | 2.1% | 0.1% 11.3% |
| Better conditions | 6 | 12.8% | 4.8% 25.7% |
| Cleanliness | 6 | 12.8% | 4.8% 25.7% |
| Amenities | 1 | 2.1% | 0.1% 11.3% |
| Shower | 1 | 2.1% | 0.1% 11.3% |
| Refrigerator | 1 | 2.1% | 0.1% 11.3% |
| Refrigerator, access to toilet | 3 | 6.4% | 1.3% 17.5% |
| Information | 2 | 4.3% | 0.5% 14.5% |
| Linen daily changed | 1 | 2.1% | 0.1% 11.3% |

| | | | | |
|---------------------|----|--------|------|-------|
| Silence | 1 | 2.1% | 0.1% | 11.3% |
| Drugs | 4 | 8.5% | 2.4% | 20.4% |
| Comfortable beds | 1 | 2.1% | 0.1% | 11.3% |
| Bell, alarm | 1 | 2.1% | 0.1% | 11.3% |
| Fewer beds | 2 | 4.3% | 0.5% | 14.5% |
| Advanced techniques | 1 | 2.1% | 0.1% | 11.3% |
| Toilets in the unit | 4 | 8.5% | 0.5% | 14.5% |
| TV, radio | 3 | 6.4% | 1.3% | 17.5% |
| Total | 47 | 100.0% | | |

The purpose of the quality standards' review is to improve continuously the quality of services provided and the ways to produce those services. Thus, a good quality management consists in planning, practical application, control and review of measures necessary for the health services and processes, so that they correspond to the permanent needs of the patients.

Our study shows a 53% satisfaction level of those pleased with the cleanliness of the ward (confidence interval (CI) 95%: 44-62.8%).

Treating all patients with the same basic levels of standard precautions involve key practices to ensure a high level of protection for patients, medical staff and visitors.

These include: hands washing (hand hygiene); the use of personal protective equipment when handling blood samples, body substances, excretions and secretions; appropriate handling of patient care equipment and soiled linen; preventing bites / cuts / injuries with proper waste handling and instruments. For this purpose, we intended to identify the gaps in the implementation of good practice protocols by the medical staff and we introduced in our survey some questions concerning the staff hand hygiene and the wear of gloves.

95% wore gloves when bandaging the patients (CI 95%: 89- 98.1%) but only 78% have changed the gloves in front of the patient (CI 95%: 69.9-85.5%). Our survey data shows that although hand washing is the most inexpensive, a simple and effective way to prevent nosocomial infections, only 60% of the medical staff washed their hands (CI 95%: 50.8-69.3%), 6.9% after each patient (CI 95%: 3-13.1%) and 31% skip washing (CI 95%: 22.8-40.3%).

Doctors' satisfaction level is related to quality of care, but it derives from the conditions in which they work; the existence of satisfaction increases the performance. In conclusion, this is a factor that can be used as criteria for evaluating the quality of work performed by the medical team. 94% of our respondents are satisfied with the professionalism of doctors (CI 95%: 88-97.5%), 91% of nurses (CI 95%: 84.7-95.8%) and a downward trend, 88% of hospital housekeepers (CI 95%: 81.6-93.8%).

Typically, patients do not have the ability or the knowledge necessary to assess the technical competence of the health care provider or how the measures for controlling the infection have been used, but they do know how they feel, how they were treated and whether expectations have been fulfilled. If a patient is well informed about what and how to prevent a nosocomial infection, then he is a win for both the orthopedic unit and for his own health. They can appreciate a health service that is convenient or not.

The existence of this part of quality (communication, training / educated patients) leads to patient's positive behaviour (accepting the medical recommendations, increased compliance to treatment, further treatment etc.), positive image of social care services and most importantly, patient satisfaction. The share of those who have been trained on the prevention of nosocomial infections by the medical personnel was of 63%. (CI 95%: 53.5-77.7%).

Among those aware of nosocomial infection, 41.6% had correct knowledge about the ways to prevent it, knew that

disinfection, cleaning and washing hands are the main measures to prevent hospital infections. While 7.3% were informed about standard precautions, they were not capable to mention any method of prevention (table no. 4).

Quality health care remains a constant concern of the orthopedic unit. Its level (high or low) determines the access to specialized medical services and ultimately the amounts that get to the hospital to secure various expenses. Patient perception concerning the quality of medical services is another concern of the hospital because this perception can seriously sway the incomes and the expenditures of the hospital. It is important that patients be cared at high level, to explain to patients the need of care and their limits, and the action to promote the activity that takes place in a hospital.

Table no. 4. The frequency of patients' opinions about the prevention of infections

| How do you avoid the nosocomial infections? | Frequency | Percent | Cumulative Percent |
|--|-----------|---------|--------------------|
| Quality disinfectants, cleaning and hand hygiene | 1 | 1.8% | 1.8% |
| Cleanliness | 2 | 3.6% | 5.5% |
| Permanent cleanliness and disinfection | 2 | 3.6% | 9.1% |
| Cleanliness and hand hygiene | 3 | 5.5% | 14.5% |
| Disinfection | 6 | 10.9% | 25.5% |
| Thick and thorough cleaning | 30 | 54.5% | 80.0% |
| I do not know | 4 | 7.3% | 87.3% |
| Restriction of visitors | 2 | 3.6% | 90.9% |
| Wash their hands more often | 2 | 3.6% | 94.5% |
| Wash their hands frequently and be disinfected | 1 | 1.8% | 96.4% |
| Hand hygiene | 2 | 3.6% | 100.0% |
| Total | 55 | 100.0% | 100.0% |

Control of infectious risk is based on an annual plan adjusted to the particularities of the orthopedic unit; the plan includes measures that aim at ensuring the hospital hygiene and the compliance with nosocomial infections surveillance strategies. To satisfy the needs of the department and therefore, of patients' there must be sufficient funding for planning, upgrading and optimization of activities.

In 2011, 72% of the etiology of nosocomial infections (Gram positive bacteria: *Staphylococcus*, *Enterococcus*, *Clostridium difficile*) is caused by the colonization of medical staff and / or the patient (nose, throat, skin, intestine) or by dirty hands; and 28% is due to transmission through contaminated items (Gram negative bacteria: *Proteus*, *Escherichia coli*, *Acinetobacter*, *Klebsiella*, *Pseudomonas*). This percentage is changing and at the end of the study period, the etiology of Gram positive infections are 50% and 50% Gram negative, which is due in equal proportions to both medical staff and patients' colonization and possibly contaminated items. It is a warning to unit management concerning the insufficient quantities of disinfectants and antiseptics, agglomeration of wards, inaccurate skills of the medical staff regarding the standard precautions.

nosocomial infections, with questions referring to quality of life.

- 90% of respondents reported pain as a factor for impaired quality of life. It affects considerably the parameters of daily activities and it also significantly reduces the quality of patients' life.
- Orthopedic patient health average is 66.42 showing an altered state, and of those with nosocomial infection is 57.85, well below the state average of the study group.
- 53% of the respondents were satisfied with the cleanliness of the ward, while 94% were satisfied with the professionalism of doctors, 91% of nurses and only 88% of hospital housekeepers.
- We identified shortcomings in the implementation of good practice protocols, although only 95% of the medical staff wore gloves only 60% washed their hands and only 7% properly washed themselves after touching the patients.
- There is still a risk of environmental contamination with Gram positive and Gram negative, which corroborated to the patient colonization and unit's shortcomings (agglomeration of wards, lack of showers in each room, insufficient quantities of disinfectants, cleaning of the unit) increase the risk of nosocomial infections and lower the quality of life and patient satisfaction.

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CONCLUSIONS

- For the first time in the hospital history, we tried to measure the satisfaction level in the patients hospitalized in an orthopedic unit and suffering from a nosocomial infection. We modified the MOS-SF36 questionnaire by adding a few items with reference to patients' knowledge about