

The Survey of Health Care Managers' Attitude towards the Implementation of Information and Communication System for the Registration of Medical Errors

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Abstract. The aim of the study has been to examine attitude and motivation of managers of Health Care Establishments for the implementation of information and communication system for the registration and reporting of medical errors. A sociological method: anonymous inquiry sent by e-mail or by post has been used to register the initial information. More than half of the health care managers (59.6% (62)) are willing to implement an information system for the registration of medical errors in their respective health care establishments.

Keywords: management, medical errors, IT, quality, patient safety.

I. INTRODUCTION

In recent years, the quality of health services is more and more related to the percentage of medical errors as they are among the reasons that expose the majority of patients to risk. One of the first surveys on this issue was made at Harvard back in 1991. The results showed then that 3.7% of the patients experienced such an incident [1]. According to L.Kohn et al., medical errors and patient safety are identified as the 8th most important cause of death in the USA [2]. This determines the growing interest of researchers all over the world and the large number of reports related to the reasons for occurrence of medical errors and their registration.

It is no accident that in 2004 the World Alliance for Patient Safety was created at the WHO. The main objective of this organization is to mobilize the global efforts in view of improving the safety of patients, who use medical treatment in all WHO member states. Therefore, in recent years, globally the stress and the efforts go more and more to the issues of patient safety from both the legal (laws, regulations, standards) and economic point of view: estimation of the cost for prevention of medical errors (adverse events) [3]–[6]. The creation and putting into operation of an information and communication system (ICS) is among the best practices for the registration, administration and evaluation of medical errors. This is the way on taking successful and regular preventive measures, as well.

Despite the will of the Bulgarian health authorities to introduce an information system for the registration of medical errors similar to those in the USA, Korea, Australia and other countries, no such surveys have been carried out so far [7]-[12]. The present survey is the first of this kind in our country.

The development and implementation of a method for the registration and actual evaluation of the cost resulting from medical errors using the advantages of modern information technologies will contribute, to a great extent, to improving the safety of patients, the quality of medical services and to reducing the amount of resources used for ineffective and inefficient medical services [13]-[17]. On the other hand, the possibility to compare the expenditure required to mitigate an adverse event that has already occurred as a result of a medical error to the expenditure required for its prevention will guarantee the rational use of the limited public resources.

The aim of this study has been to examine attitude and motivation of managers of Health Care Establishments (HCEs) for the implementation of an information and communication system for the registration and reporting of medical errors.

II. MATERIALS AND METHODS

The study is representative. It was carried out in two stages:

- During the period between April and June 2011, we carried out a pilot survey among 39 managers of health care establishments in Plovdiv to test the reliability and the validity of the tools that we had prepared.
- The second stage of the study covered the period between September and December 2011, where an inquiry was carried out with hospital managers from all over the country.

The logical units are all of the hospital managers within the territory of the Republic of Bulgaria and the technical units are all the hospitals located within the same territory.

Method for identification of the representative sample: the monitoring units were chosen according to the simple randomization principle.

- At the first stage, all the health care establishments that had concluded contracts with the National Health Insurance Fund were identified.
- At the second stage, the final number of the respondents to be monitored was determined. From the list of 333 HCEs in Bulgaria, 167 HCEs were randomly selected, which amounted to 50% of the total number of HCEs.

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A sociological method: anonymous inquiry sent by e-mail or by post was used to register the initial information. One hundred and sixty-seven (167) questionnaires were sent, of which 104 were returned after a reminder. The number of valid questionnaires was 104, which comprised 62% of the predetermined target sample.

The term "medical error" was defined in the introduction of the questionnaire in order to avoid ambiguity and bias. The IOM's definition was translated and brought to the attention of the respondents [2].

According to the IOM, a medical error is "failure of a planned action to be completed as intended or the use of a wrong plan to achieve an aim. Errors can include problems in practice, products, procedures, and systems".

As there are many classifications of medical errors, the authors of the paper offer the classification given by Lazarou et al. They proposed the following seven categories of medical errors that can occur [18]:

- 1. Medication error such as a patient receiving the wrong drug.
- 2. Surgical error such as amputating the wrong limb.
- 3. Diagnostic error such as misdiagnosis leading to an incorrect choice of therapy, failure to use an indicated diagnostic test, misinterpretation of test results, and failure to act on abnormal results.
- Equipment failure such as defibrillators with dead batteries or intravenous pumps, whose valves are easily dislodged or bumped causing increased doses of medication in too short a period of time.
- 5. Infections such as nosocomial and post-surgical wound infections.

- 6. Blood transfusion related injuries such as a patient receiving an incorrect blood type.
- Misinterpretation of other medical orders such as failing to give a patient a salt-free meal, as ordered by a physician.

The questionnaire involved nine closed questions and one open question related to:

- admitting and identifying medical errors;
- the attitude of health care managers towards the registration of medical errors;
- the impediments that the implementation of an information system for the registration of medical errors would have to face;
- the principal features of the potential ICS;
- the organization of the registration and of the patient and public access to the existing information.

The software product SPSS 17 and MS Excel were used for data processing. Descriptive, alternative, non-parametric and graphic analysis methods were used.

III. RESULTS AND DISCUSSION

The average age of the respondents was 48.2 ± 9.1 , and 42.4% (44 people) had a Master Degree in Health Management.

Despite the delicate attitude of the managers towards the existence of medical errors, 32.7% (34) admitted having made some medical errors in the course of their career, and 61.5% (64) said that they witnessed medical errors made by their colleagues.

The distribution of the answers provided by the managers questioned about the consequences of the implementation of an ICS for the registration, reporting and economic evaluation of medical errors is shown in Table 1.

1. Creating a negative public perception for healthcare organization	Yes			No			Do not know		
	No.	%	Sp	No.	%	Sp	No.	%	Sp
	40	40.4	4.81	54	52	4.89	8	7.6	2.59
2. Adverse consequences for individual career development of staff	Yes			No			Do not know		
······	No.	%	Sp	No.	%	Sp	No.	%	Sp
	42	40.4	4.81	52	50	4.90	10	9.6	2.88
3. Improving the quality of health services and patient care	Yes			No			Do not know		
	No.	%	Sp	No.	%	Sp	No.	%	Sp
	64	61.5	4.77	32	30.8	4.53	8	7.7	2.61

TABLE 1 IMPORTANCE OF THE IMPLEMENTATION OF ICS ACCORDING TO RESPONDENTS

According to 40.4% (42) of the respondents, the absence of penalties for the attendant upon reporting medical errors would facilitate the implementation of such an information system. Approximately half of them (45% (44)) believe that this would not facilitate or help the implementation of the system, and 17.3 (18) did not answer this question.

The responses to this question are influenced to some extent by the personal approach, disseminated in the past – imputation of guilt for the malpractices performed in the process of patients' treatment. According to this approach, a physician, who has made a medical error, is considered incompetent, irresponsible and should be punished, including

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by prohibiting practicing his/her profession in the future [19]. Pursuant to other authors, besides being accused by his/her colleagues, the doctor, who made a medical mistake, often experiences feelings of guilt and shame, blames him/herself that he/she has not taken adequate care for the patient [20],[21] and at the same time experiences the fear of punishment or dismissal. Personal approach to the management of medical errors is to maintain or even increase the level of mistakes; errors of the same type are repeated many times.

Using the advantages of the information technologies, the authors of the article try to introduce the so-called systematic approach that focuses on demand, analysis and the causes of the error nascence.

Systematic approach recognizes that people make mistakes, and that they can not prevent any error themselves in a poorly designed system. Thus, systems must be designed to withstand human errors, even during busy periods or when people are tired. The key approach to reducing errors is to improve the current system, since it is believed that it is much more difficult to make errors in the best systems.

From the systematic approach perspective, errors should be discussed and lessons should be learnt from them, i.e., to learn from our mistakes and not to hide them [2].

The goal of the systematic approach is through analysing the causes to prevent recurrence of the same type of errors, to identify and disseminate best practices that lead to a sustained downward trend of errors.

Some scientists believe that the introduction of ICS aims at changing the organizational culture in a medical community – the "culture of blame" to a "culture of self-evaluation and improvement of medical care quality" [13].

Our efforts are focused on developing an algorithm of prevention, based on the Deming cycle [22] (see Fig. 1).

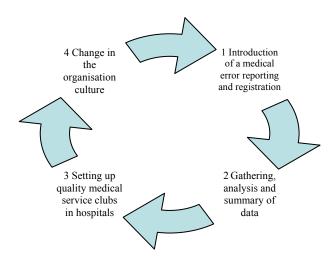


Fig. 1. Model of medical error prevention.

To the question: "Who should register the notices of medical errors?" 65% (68) of respondents answered that this should be done by a specially trained staff.

The distribution of all the answers to this question is shown in Fig. 2.

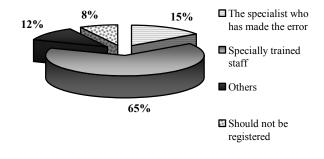


Fig. 2. Attitude of respondents towards the registration of medical errors.

In the answer "Others", which was left open, the respondents indicated the Head of Ward, the Bulgarian Medical Association, the Medical Audit Executive Agency, or an expert committee.

The answers of the respondents show that the majority prefers the state structures to be responsible; in contrast, foreign research preferences are shifting to non-profit patient groups and organizations [23].

Particularly controversial answers were given to the question related to the access of patients to the system for the registration of medical errors and the possibility for them to file complaints in case they had concerns about potential medical errors.

The results showed that half of the medical experts believed that the patients should only have the right to file complaints but not to have access to the whole information registered. The distribution of the answers is shown in Fig. 3.

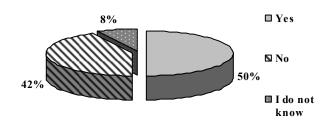


Fig. 3. Respondents' attitude towards the access of patients to the ICS.

The assumption that the information system for the registration of medical errors should have different levels of access was also stated by other researchers in their studies on the subject.

According to the health care managers, the main functions and features of the information system for the registration of medical errors should be the following:

- improving the care for patients A;
- training opportunities for medical staff B;
- easy form and contents, time saving functionalities minimizing the volume of additional work to perform (e.g. ticks, templates), without long or heavy forms of work for users or the organization - C;
- assuring the anonymity of the complaint sender D;
- the personal data of the patient, who has suffered from the error, should not be placed in the public space but in a restricted access database E;
- the system should not include penalties, i.e., where
 a medical system is registered, the information
 should not be used for the purpose of persecution
 or prosecution by the claimants (that is to say
 shifting the focus from "accusation" and "penalty"
 to "prevention" of medical errors) F;

Similar descriptive characteristics of the information systems for the registration of medical errors are also derived by other researchers [11], [16].

The distribution of the answers is shown in Fig. 4.

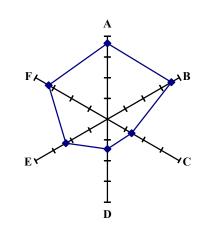


Fig. 4. Features of the information system.

More than half of the health care managers (59.6% (62)) would like to implement an information system for the registration of medical errors in their respective health care establishments; 21.2% (22) would not do it, and 19.2% (20) did not answer this question.

The study established a correlation between the managers' intentions to implement such a system and the following determinants: 1) Creating a negative public perception of the healthcare organization, and 2) Improving the quality of health services and patient care (see Table 2).

Ν	Variables		Non-param	etric analysis	Measuring the strength of correlation		
	Independent	Dependent	χ^2	Importance	Cramer's coefficient	Importance	
1.	Creating a negative public perception of the healthcare organization	Willingness to implement the ICS within the HCE	11.26	0.001	0.329	0.001	
2.	Improving the quality of health services and patient care	uality of healthimplement the ICServices and patientwithin the HCE		0.002	0.330	0.002	

 TABLE 2

 FACTORS THAT AFFECT THE HEALTH CARE MANAGERS' INTENTIONS TO IMPLEMENT AN ICS

Using non-parametric analysis, the authors of the article have confirmed the assumptions that the creation of negative public perception of the healthcare organization and the improved quality of health services and patient care affect the intentions of health care managers as to implementing the system. The analysis of the results has shown a moderate interdependence between the respondents' attitudes towards both factors (see Table 1). According to them, the implementation of an ICS for the registration of medical errors will create a negative public perception of the healthcare organization and decrease their willingness to implement such a system; on the other hand, the possibility to improve the quality of health services and patient care positively affects the willingness to implement an ICS for the registration of medical errors.

It is recognized that there are major barriers to medical reporting, such as the 'culture of blame' [24], [25]. To promote participation of health care service providers, it should be made clear in advance that the person reporting shall remain anonymous, that no charges will be pressed and he or she will not be prosecuted.

IV. CONCLUSION

There is an actual positive attitude of health care managers towards implementing an information system for the

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registration of medical errors despite the existing concerns related to potential criminal prosecution.

Some of the questioned professionals believe that the information and communication system should take into account the specific characteristics of the work of different medical specialists by types, nature and weight.

The managers of healthcare organizations are of the opinion that the access of patients to the ICS should be restricted, i.e., they should only have the right to file complaints but should not have access to the recorded information.

Many respondents share the conviction that the implementation of a system that registers all adverse events will increase the chance to improve the quality of medical services. According to them, the objectives related to creating modern work conditions by using high-tech and reliable tools, as well as the improved possibility to attend additional training, are attainable only after a critical analysis of the reasons for occurrence of medical errors or adverse events and elaboration of prevention mechanisms.

The social benefits from the implementation of an information and communication system for the registration and reporting of medical errors may be summarized in several aspects [26]:

- raised awareness on issues related to medical errors;
- promoted exchange of successful solutions and good practices among health care providers;
- culture of open debate, the aim of which is not to blame but to promote the registration of medical errors so that initiatives could be developed to prevent errors;
- development of best practices aiming at reducing medical errors;
- lowering medical care expenses through eliminating errors and their repeated occurrence.

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Rumjana Stojanova, Rosica Dimova, Ralica Raičeva. Pētījums par veselības aprūpes iestāžu vadītāju viedokli sakarā ar informatīvi komunikatīvās medicīnas kļūdu reģistrēšanas sistēmas ieviešanu

Pēdējos gados veselības aprūpes pakalpojumu kvalitāte arvien biežāk tiek novērtēta, ņemot vērā pieļauto medicīnas kļūdu procentu, jo tas ir viens no galvenajiem iemesliem, kas visbiežāk nostāda pacientu riska situācijā. Tāpēc arvien vairāk valstis tiecas ieviest attiecīgas reģistrācijas un atskaites sistēmas. Mērķis ir noteikt visbiežāk sastopamās medicīnas kļūdas un veikt to profilaksi, lai panāktu medicīnas pakalpojumu līmeņa paaugstināšanos un samazinātu ar tām saistītos papildus izdevumus. Bulgārijā vēl joprojām nav izstrādāta attiecīga likumdošanas sistēma, kas reģistrētu nevēlamus notikumus.

Pētījuma mērķis ir noskaidrot medicīnas iestāžu vadītāju attieksmi un motivāciju, lai ieviestu informatīvi komunikatīvo sistēmu (IKS), kas reģistrētu un apkopotu medicīnas kļūdas.

Izmantota ir socioloģiskā aptaujas metode, izmantojot tradicionālo un e-pastu. Aptaujā piedalījās 104 pēc nejaušības principa izvēlēti medicīnas iestāžu vadītāji no visas valsts.

Pētījumā noskaidrojās, ka aptaujātie vadītāji pozitīvi novērtē informatīvās sistēmas ieviešanu, kas reģistrētu to pakļautībā esošajās veselības aizsardzības iestādēs pieļautās medicīnas kļūdas – 59,6% (62).

Galvenie faktori, kas nosaka aptaujāto gatavību ieviest vai neieviest IKS medicīnas kļūdu reģistrēšanai, ir šādi: 1) iespēja paaugstināt medicīnas pakalpojumu līmeni, kas pozitīvi ietekmē gatavību ieviest IKS medicīnas kļūdu reģistrēšanai – $61,5\%\pm4,77\%$, P<0,002, V= 0,330; 2) aptaujāto nevēlēšanos ieviest šo informatīvo sistēmu nosaka negatīvā ietekme, ko tāda IKS varētu atstāt uz sabiedrības viedokli – $40,4\%\pm4,81\%$, P<0,001, V= 0,329.

Румяна Стоянова, Росица Димова, Ралица Райчева, Исследование отношения менеджеров здравоохранения для введения информационнокоммуникационной системы для регистрации медицинских ошибок

В течение последних лет качество услуг в сфере здравоохранения всё чаще определяется процентом допущенных медицинских ошибок, так как они являются одной из причин, которые подвергают пациентов риску. В связи с этим, увеличивается число стран, которые стремятся ввести системы регистрации и отчета ошибок. Цель – путем идентифицирования и превенции наиболее повторяющихся медицинских ошибок достичь повышения качества медицинской помощи и снижения сопровождающих нововозникающих расходов. В Болгарии всё ещё не введено правовое регулирование и система регистрации нежелательных событий.

Целью исследования является определение условий и мотивации заведующих больничных лечебных заведений, для введения информационнокоммуникационной системы (ИКС) для регистрации и отчета медицинских ошибок.

Авторы использован социологический метод - анкетирование, которое проведено путем электронной почты (e-mail-oм) и почтой. В нем приняли участие 104 менеджеров больничных лечебных заведений со всей страны, выбранных случайным путем.

Исследование выявило положительные тенденции со стороны менеджеров здравоохранения для введения информационой системы, в целях регистрации медицинских ошибок в управляемом ими лечебном заведении - 59,6% (62).

Основные факторы, которые оказывают влияние на их намерения ввести или не ввести ИКС для регистрации медицинских ошибок являются как ниже следует: 1) возможность улучшения качества медицинского обслуживания, которое оказывает положительное влияние на их желание ввести ИКС для регистрации медицинских ошибок – 61,5%±4,77%, P<0,002, V =0,330; 2) негативное воздействие, которое может возникнуть в результате подобной ИКС на общественное мнение, оказывает влияние на их нежелание ввести такую информационную систему - 40,4%±4,81%, P<0,001, V = 0,329.