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## HEALTH AND ADMINISTRATIVE PROFESSIONALS PERCEPTION REGARDING THE PATIENTS ELECTRONIC MEDICAL RECORD (EMR)

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### ABSTRACT

Patient records are an essential part of the present and future medical care provided to the patient. In addition, medical records are used in the management and planning of health services and facilities, for medical research and in the generation of health and care data. This study aimed to evaluate, through the application of questionnaires, the Electronic Medical Record (EMR) advantages and disadvantages observed by users, at the University Hospital Clemente de Faria (HUCF), Montes Claros - MG. Health professionals emphasized the EMR advantages: agility at work, reduction in errors of transcription of drugs and supplies, and easy access to patient information. However, professionals have expressed concern about confidentiality. The group of administrative servers highlighted the interface with other administrative areas of the hospital, in addition to routine standardization. Both groups agreed that the EMR is more efficient than the paper medical records (PMR). However, health professionals considered insufficient the support given to users, while the administrative servers responded were neutral. In conclusion, it can be observed that in the HUCF-Montes Claros the positive points of the EMR outweighed the negatives in the two participating groups.

## INTRODUCTION

The data compilation provided by the patient and/or legal guardians, the medical procedures adopted and the results obtained in any type of examination, constitutes the patient's medical record (Silva, 2007). This document allows monitoring the evolution of the person assisted and guides the best therapeutic or rehabilitation procedure, besides indicating all the associated measures, as well as the wide variability of preventive care adopted by health professionals (Novaes, 1998; Mota, 2005). The patient's medical records remained documented on paper until recently, but with the facilities provided by Information and Communication Technologies (ICT), hospitals are increasingly adopting this document in electronic format, commonly known as Electronic Medical Record (EMR) (Pinto, 2007; Bezerra, 2009).

In Brazil, the EMR appeared in the university environment in the 1990s, but only in 2002 the Ministry of Health proposed a minimum set of information about the patient that should be included in a medical record (Patrício *et al.*, 2011). In 2007, the Federal Council of Medicine (FCM) approved the technical standards for the digitization and use of computerized systems for the custody and handling of patients' medical records, authorizing the exchange of information identified in health and eliminating the use of sheets (Patrício *et al.*, 2011). The Electronic Record Booklet - certification of health records (page 3, 2012) - emphasizes that the composition of a medical record, regardless of whether it is electronic or on paper, should follow the FCM guidelines and determinations (Resolution 1638/2002), which defines medical records and makes it mandatory to create the Medical Records Review Committee in health institutions.

Despite the EMR short time use in Brazil, to date, advances have been made in the improvement of technologies and in the aggregation of new functionalities. However, usage difficulties and resistance by health professionals are reported (Patricio *et al.*, 2011). Thus, after previous knowledge about the Electronic Medical Record and the main benefits and obstacles of its implantation, structured questionnaires were constructed and applied to the University Hospital Clemente de Faria (HUCF) health and administrative professionals. In this sense, the present study aimed to evaluate the perception of HUCF health and administrative professionals regarding the adoption and efficacy of the Electronic Medical Record in this institution, identifying possible measures to be adopted to improve this tool quality and efficiency.

## METHODS

### Research design

It is a transversal, exploratory, descriptive and quantitative study. The scenario for the development of this study was carried out at the HUCF of Montes Claros - MG, which had 1,300 employees and collaborators in the studied period. This project was submitted and approved by the Research Ethics Committee of the Universidade Estadual de Montes Claros (Unimontes) under the protocol number 1.175.316 (August, 7<sup>th</sup>, 2015).

### Population and study sample

Physicians, nurses, nursing technicians and administrative personnel (directors, managers and coordinators) directly involved in filling in and/or information retrieval contained in the EMR, composed the population (Table 1). The sample size was calculated as 213 employees, adopting a tolerable sampling error of 6%. To select the employees in the sample composition, the stratified random sampling method was chosen, proportional to the number of employees per function group, thus guaranteeing the representativeness of both groups in the survey.

### Data Collection Instrument

As a collection tool, a structured script was used, containing 21 questions for the interviews of the Health team and the other with 11 questions for the administrative team (Supplementary material). Each participant was instructed to indicate their level of agreement regarding the items of the questionnaire using a five-point Likert scale: 1 - totally disagree, 2 - partially disagree, 3 - neither agree nor disagree, 4 - partially agree and 5 - I totally agree (Vieira, Dalmoro, 2008).

**Table 1. HUCF team (which uses the MV system) and sample used for questionnaire application**

Function	Employees		Sample	
	n	% <sup>1</sup>	n	% <sup>2</sup>
Health professionals	730	80.2%	176	24.1
Administrative professionals	180	19.78%	41	22.7
Total	910	100%	217	23.8

<sup>1</sup>Percentage relative to the total number of employees.

<sup>2</sup>Percentual relative to the total number of employees per the function group.

**Statistical analysis:** Data analysis was performed using the statistical program (Statistical Package for the Social Sciences

- SPSS) version 23.0. To verify the concordance between the responses of the two groups of participants, the chi-square test was used. Fisher's Exact Test was used to compare all categories of responses (2x2 tables) when the assumptions of the Chi-square test ( $X^2$ ) were not valid.

## RESULTS AND DISCUSSION

### Responses of the HUCF health professionals of Montes Claros – MG

The answers obtained through the application of the questionnaire to 176 health professionals were grouped into four (4) large groups, according to the type of information provided: patient information, information management, EMR versus Paper and Usage Facilities. Data on access to patient information (statements 2, 6 and 9) are summarized in Table 2. Regarding the statement 2, 69.9% of the health professionals partially or totally agreed, indicating that EMR allows quick access to relevant information about the patient. Likewise, these professionals indicated the efficiency of the EMR to monitor (statement 9): patient absenteeism, consultations duration and the requests for exams, since 67% of the respondents agreed partially or totally with this statement. Concerning the patient information confidentiality (statement 6), 49.5% believe that EMR preserves patient confidentiality (responses 4 and 5). Although this index is relatively high, a relevant portion - 23.3% of these professionals - disagrees with this statement. In addition, 27.3% of the professionals did not agree or disagree, leading us to reinforce the idea of uncertainties regarding weaknesses and fraud possibilities in electronic systems. The results tell us that healthcare professionals agree that EMR allows adequate storage of patients' personal and clinical data. Although the answers to statement 6 have a smaller predominance, which is impacted by the frequency of the answers that do not agree or disagree with the affirmation. In general, these results corroborate the literature, since the increase in the quality of patient records (Patricio *et al.*, 2011) and the availability of the patient's previous care and history data are highlighted as benefits of EMR (Perondi *et al.* 2008). Similarly, reaffirming one of the major disadvantages cited by other authors (Novaes, BELIAN, 2004; Thomas, 2009; Costa, 2003), the health professionals participating in this study have shown uncertainty about the patient information confidentiality. Thus, it is important to establish access and limitation traceability according to the profile functional level.

The answers of the professionals regarding Information Management (statements 4, 5, 7, 8, 10 and 14) are presented in Table 2. Regarding statement 4, 66.5% of the health professionals agreed partially or totally, indicating that EMR reduces errors in the transcription of medications and prescribed materials to patients. A similar index - 64.2% of the participants agreeing partially or totally - was obtained by the analysis of the professionals to the statement 5, whose content deals with the integration of the EMR information and consequent agility of the assistance provided. An even larger number of participants agreed with statement 7: "The use of EMR facilitates access to information for research at the University Hospital," only 11.4% of health professionals disagreed. However, regarding the EMR information order, 34.6% was the index of dissatisfaction obtained and expressed through responses that disagreed partially or totally with statement 8. This dissatisfaction with the information inserted

in the EMR is reinforced in the answers of question 14, in that 39.8% disagreed totally or partially with the statement "EMR fields meet your needs." In addition, health professionals dissatisfied about the technical support provided to users, since 60.22% of them disagreed with statement 10. According to results presented in Table 2, it can be seen that the perception of HUCF health professionals corroborates the conclusion obtained in a study conducted by Thomas (2009), which points out the reduction of medical errors and the "just in time" access among the advantages of computerized health systems. However, dissatisfaction can be observed among the interviewees in relation to the information collected and the order in which they are inserted into the system (statement 8 and 14). This fact corroborates with Monteiro (2003) and Alves (2007) who point out that most systems developed today did not arise as support or rationalization of existing work, but as a totally new process. In this way, an improvement possibility would be the collaboration of the professionals directly involved and already aware of the institution needs in the system updates, in order to generate continuous improvement.

The answers of the professionals regarding the comparison between EMR and the paper medical records (PMR) (statements 3, 12, 16 and 18) are presented Table 2. 53.4% of the respondents totally agreed that electronic format is better than paper. When answers 4 and 5 are analyzed (partially or totally agree), it is observed that 76.7% agree with the statement, that is, the majority of respondents approve the use of the electronic document. The statement 12 had the intention to evaluate the agility that the data began to be inserted, and 48.3% of the participants indicated that the EMR is faster. A similar index was obtained with statement 16, which aimed to evaluate the search for information (history and exams), since 47.2% totally agreed with the EMR benefits. The statement 18 sought to raise the impression of the interviewees about the errors found in the two alternatives, EMR and PMR. The result showed that few users (10.8%) agree that the errors are more common in the EMR, however, a large proportion (26.7%) did not agree or disagree with the statement. Thus, the EMR advantages can be reinforced by observing the distribution of participants' responses (Table 2), which allows us to conclude that EMR seems superior than paper, since the answers to the statements in this group are predominantly concordant. Furthermore, the last question of this group obtained most of the discordant answers regarding EMR errors in comparison with PMR. Thus, the results obtained in this work phase portray an adaptation of the users to the system, suggesting that the EMR positively influences the routine, both in data feeding and in access to information, which agrees with the advantages cited by Brochetto *et al.* (2015).

In the last answers group, data on the facilities for using the EMR (statement 1, 11, 13, 15 and 17) compiled in table 2 are shown. Responses to statement 1 show a high degree of disagreement when it comes to EMR ease of use, since 39.7% of the participants disagreed totally or slightly. This information is more valuable when analyzed along with statement 13, which deals with the training efficiency in the electronic medical record, with 60% discordance rate. However, 67% of these same interviewed agreed that the EMR is appropriate to the tasks they perform. In this same direction, 61.3% stated that the EMR served to streamline the work performed by the health professionals. In addition, it can be observed that the possibility of the system temporary

interruption is a concern, since 65.9% showed disagreement about the existence of a secondary care plan. When we analyze the frequency distribution of the chosen answers options in this group of alternatives, we confirm what was already discussed above, since the statements regarding the use and benefits of EMR can be visualized through the concordant tendency for statements 1, 11 and 17. The statements related to training and the alternative plan in the absence of the system have a discordant tendency, which refers to the notorious EMR difficulties and disadvantages: high training costs, often resulting in a team with difficulties and / doubts and susceptibility to system failures (COSTA, 2003).

### HUCF administrative servers answers

The answers obtained by applying the questionnaire to the 41 administrative servers of the HUCF of Montes Claros - MG are presented in Table 3. The statements were formulated with the purpose of evaluating the consequences of the EMR implementation in the information standardization, agility and efficiency, comparing with the traditional PMR. Regarding the auxiliary electronic medical record in the hospital audit sector (statement 1), 63.41% of the servers totally agreed with this statement, and 14.63% partially agreed. In addition to this, item 6 that correlates the EMR to greater facilities in the hospital billing service, obtained 58.54% of total agreement. This indicates that the EMR helps in interfacing with other areas, including administrative areas. Regarding statement 2 (standardization of hospital routines) 80.49% agreed totally or partially, indicating that the EMR might be beneficial to the program.

The statement 3 obtained 70.73% of agreement (total or partial) from the servers interviewed, that is, the majority of them agreed that the EMR reduces the loss of medical records and information. However, a smaller portion (58.54%) agreed with item 7, which states that the work became more agile with the EMR implementation. Similarly, the 51.22% index of the universe surveyed totally agreed that the EMR is more effective than the PMR (statement 5). The answers to alternatives 5 and 7 should be evaluated together with the information obtained from item 4 (the hospital offers technical support to meet users' needs), since 43.9% of the interviewees disagreed (totally or partially) that the hospital provides technical support to users' needs. Thus, it is inferred that the users interviewed recognize the benefits of the system, but somehow feel unprepared to use it. When analyzing the frequency distribution of the options chosen by the administrative servers, it is possible to visualize more easily the dispersion of the chosen options in statement 4 (The hospital offers technical support to meet the needs of the users). Higher dissatisfaction rates were observed, similar to the answers of health professionals, thus emphasizing the need of appropriate training and updating (COSTA, 2003). In addition, it can be seen that, regarding the interface facilities resulting from the EMR implementation (alternatives 1, 2 and 6), there is a consistent trend indicating improvements in the quality of services offered, which corroborates that described by Martins *et al.* Lima (2014).

### Health professionals and administrative servers answers comparison

Some statements were included in both set of questionnaires, and served to evaluate how the different groups contextualize some basic points of the EMR implementation.

**Table 2. Health professional perspectives regarding the questionnaire statements, University Hospital Clemente de Faria, Montes Claros, Brazil**

Statements	Percentage (%)				
	1	2	3	4	5
1- The EMR is easy to use.	11.9	27.8	8	37.5	14.8
2- The EMR allows quick access to relevant information about the patient.	9.7	15.9	4.5	36.9	33
3- EMR is better than PMR.	6.8	6.3	10.2	23.3	53.4
4- EMR avoids errors in the transcription of drugs and materials names.	10.8	18.2	4.5	25.6	40.9
5- The EMR integrates information. promoting the agile progress of the assistance.	8.5	16.5	10.8	26.1	38.1
6- The EMR preserves the patient information confidentiality.	11.4	11.9	27.3	27.3	22.2
7- The use of the EMR facilitates the access to information for research in the University Hospital.	2.3	9.1	14.8	21.6	52.3
8- In the EMR the information order are in agreement with its necessity.	10.2	24.4	20.5	30.1	14.8
9- The use of the EMR helps to monitor patient absenteeism, consultations duration period and the requests for exams.	8.5	6.3	18.2	36.9	30.1
10- The Hospital offers technical support to meet the needs of the users.	33.5	26.7	10.8	25.6	3.4
11- The EMR is suitable for my tasks in this Hospital.	10.8	15.3	6.8	47.7	19.3
12 - The EMR filling information is faster than the PMR.	17	3.4	4.5	26.7	48.3
13 - EMR training was sufficient with its implementation.	30.7	27.3	13.6	17.6	10.8
14- EMR fields meet your needs.	9.7	30.1	12.5	36.9	10.8
15 - There is a secondary service plan in case of temporary interruption of the system operation.	43.2	22.7	14.8	19.3	0
16 - The search for information (such as test results and patient history) in the EMR is easier than in the paper medical record.	2.3	6.8	15.9	27.8	47.2
17 - My work became more agile after the EMR implementation.	17	11.4	10.2	24.4	36.9
18 - Errors are more common in EMR than in PMR.	27.3	21.6	26.7	13.6	10.8

1: Totally disagree. 2: partially disagree. 3: neither agree nor disagree. 4: partially agree and 5: I totally agree. EMR: Electronic Medical Record. PMR: Paper Medical Record.

**Table 3. Health professional perspectives regarding the questionnaire statements, University Hospital Clemente de Faria, Montes Claros, Brazil**

Statements	Percentage (%)				
	1	2	3	4	5
1- The EMR assists in the Audit Sector of the Hospital.	2.44	2.44	17.07	14.63	63.41
2 - The EMR contributes to the standardization of hospital routines.	0	2.44	17.07	43.90	36.59
3- The EMR reduces the loss of medical records and information.	12.19	4.88	12.19	26.83	43.90
4- The Hospital offers technical support to meet the needs of the users.	19.51	24.39	12.19	26.83	17.07
5 - The EMR is more effective than the paper medical record.	2.44	4.88	17.07	24.39	51.22
6 - EMR facilitates the billing service of the Hospital.	2.44	4.88	14.63	19.51	58.54
7 - My work became more agile after the EMR implementation.	7.31	19.51	14.63	26.83	31.71
8 - The lack of information. due to inadequate filling is more common in EMR as compared to PMR.	4.88	9.76	43.90	26.83	14.63

1: Totally disagree. 2: partially disagree. 3: neither agree nor disagree. 4: partially agree and 5: I totally agree. EMR: Electronic Medical Record. PMR: Paper Medical Record.

These statements and the results obtained are presented in table 4. In response to the statement "EMR is better than PMR," similar indices indicate that most respondents agreed with the statement. It is observed that there is a substantial agreement between the two groups, since there is no significant difference between the groups ( $p = 0.632$ ) when submitted to the Chi-Square test ( $X^2$ ).

**Table 4. Responses to the statements applied to both groups (health and administrative professionals) interviewed at HUCF - Montes Claros**

Statements	Answers (%)				
	1	2	3	4	5
EMR is better than PMR					
Health professionals	6.8	6.3	10.2	23.3	53.4
Administrative professionals	2.4	4.9	17.1	24.4	51.2
The hospital offers technical support to attend the needs of the users					
Health professionals	33.5	26.7	10.8	25.6	3.4
Administrative professionals	19.5	24.4	12.2	26.8	17.1
The job became more agile following EMR implementation					
Health professionals	17.0	11.4	10.2	24.4	36.9
Administrative professionals	7.3	19.5	14.6	26.8	31.7

1: Totally disagree. 2: partially disagree. 3: neither agree nor disagree. 4: partially agree and 5: I totally agree. EMR: Electronic Medical Record. PMR: Paper Medical Record.

However, it was observed that the assumption of expected values greater than 5 of the chi-square test was not valid and therefore multiple comparisons were made through the Fisher Exact Test and no significant difference was observed ( $p > 0.05$ ), which confirms the opinion agreement results between the groups compared.

## Conclusion

In view of the results presented and discussed, it is concluded that the health professionals agreed that EMR helps to monitor patient's information and that its implantation was beneficial to Information Management, evaluating it as being superior to paper medical record. However, there was uncertainty regarding control, confidentiality and access to information, as well as a lack of sufficient training for the EMR use and professional dissatisfaction with the support given to EMR users. It was also concluded that the administrative staff indicated the benefit of the EMR as an integrated use with the administrative areas, such as control, auditing and financial sector, allowing a standardization of the hospital routine. It is reiterated that there is a need to invest more in technical support and training to EMR users, especially health professionals.

**REFERENCES**

- Alves, V.Q. 2007. O desenvolvimento de prontuário eletrônico na perspectiva de médicos e usuários: um estudo dos hospitais da cidade de Campina Grande-PB. 11 de junho de 2007. 215 f., Dissertação. UFPB, João Pessoa – PB.
- Bezerra, S.M. 2009. Prontuário eletrônico do paciente: uma ferramenta para aprimorar a qualidade dos serviços de saúde. *Revista Meta: Avaliação*. v.1, n.1, p.73-82.
- Costa, C.G.A. 2003. Prontuário Eletrônico do Paciente: Legislação, Auditoria e Conectividade - 8º Congresso Latino Americano de Serviços de Saúde.
- Monteiro, E. 2003. Integrating health information systems: a critical appraisal. *Methods of Information in Medicine*, v.42, n.4, p.428-32.
- MOTA, F.R.L. 2005. Prontuário Eletrônico do Paciente: estudo de uso pela equipe de saúde do Centro de Saúde Vista Alegre. 2005. 109 f. Dissertação. Escola de Ciência da Informação, UFMG, Belo Horizonte.
- Novaes M.A., Belian R.B. 2004. Pontos estratégicos para especificação de um prontuário eletrônico do paciente como instrumento de cooperação clínica na web. In: Sociedade Brasileira de Informática em Saúde. Anais do IX Congresso Brasileiro de Informática em Saúde, Ribeirão Preto, SP. Brasil
- Novaes, M.A. 1998. Prontuário Eletrônico do Paciente (EMR). In: I Seminário de Tecnologia da Informação em Saúde, Recife, PE.
- Patrício, C.M., Maia, M.M., Machiavelli, J.L., Novaes, M.A. 2011. O prontuário eletrônico do paciente no sistema de saúde brasileiro: uma realidade para os médicos? *Scientia Medica (Porto Alegre)* v.21, n.3, p.121-131.
- Perondi, M.B.M., Sakano, T.M.S., Schwartsman, C. 2008. The use of an electronic medical system in a pediatric emergency department with a clinical score triage system. *Einstein*, v.6, p.31-6.
- Pinto, V.B. 2007. Prontuário eletrônico do paciente: documento técnico de informação e comunicação do domínio da saúde. *Revista eletrônica de biblioteconomia e ciência da informação*, v.11, n.21, p. 34-48.
- Silva, F.G., Tavares-neto, J. 2007. Avaliação dos prontuários médicos de hospitais de ensino no Brasil. *Revista Brasileira de Educação Médica*, v.31, n.2, p. 113-126.
- Thomas, J. 2009. Medical records and issues in negligence. *Indian Journal of Urology*, v.25, n.3, p. 384-88.
- Vieira, K.M., Dalmoro, M. 2008. Dilemas na Construção de Escalas Tipo Likert: o Número de Itens e a Disposição Influenciam nos Resultados? XXXII ENCONTRO ANPAD. Rio de Janeiro- RJ.

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