Analysis of Medical Records Management in Brazilian Basic Healthcare Units:
A Qualitative Approach

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Abstract—Researchers around the world have searched for ways to control access of Electronic Medical Records (EMR) in the healthcare environment, from primary to tertiary sectors. Each country, state and city has particular means of controlling that access. However, there are places where there is no digital control, and this is the reality of several Brazilian regions. The objectives of this work were to understand how Basic Healthcare Units (BHU) control access to patients' medical records, to verify the existence of both paper and electronic medical records, and to compare the situation in BHUs with the current legislation. A qualitative research was conducted through semi-structured interviews with 29 employees from BHUs in five regions of the city of Londrina - Paraná (Brazil). Afterwards, the content analysis proposed by Bardin was carried out. The results show that the healthcare environments studied in this research lack computerization and electronic control of patients' medical records and they still use paper medical records. This research makes it possible to compare the reality practiced in the BHU with the current legislation. The paper seeks an understanding of the requirements of the healthcare servers to support future research into the implementation of computational models in electronic records and access control effectively applicable in the healthcare context. The findings of this qualitative research provide deeper knowledge of the reality of healthcare environments, the employees' behavior, patients behavior and the interaction between these elements and the medical records.

Keywords–Electronic Medical Record; Qualitative Research; Basic Healthcare Units; Cloud Computing.

I. INTRODUCTION

A medical record can be defined as the patient's or client's organized and concise documentation, containing a record of medical care provided, as well as all information, examinations, procedures and any pertinent documents. The medical record belongs to the patient, the records are under the care and responsibility of the doctors and health institutions. Therefore, it is an extremely relevant document mainly for the healthcare system (containing an easy-to-handle chronological evolutionary data, that allows a global view of the patient's clinical status, permitting communication among the different healthcare professionals), education (being used to discuss cases among teachers and students); scientific research (the information contained in the medical record can serve as secondary data for research), quality control (enabling the management of medical and hospital activities), and for the control of the costs that are dependent on the accuracy and details of the information contained in the medical records.

The management of medical records has become easier in the last decades through computational advances that allow previously-known technologies to be improved and used in different ways in computational environments. The advances in technology and its increasing presence in the patient care process, such as Electronic Health Record (EHR), Electronic Medical Record (EMR) and Picture Archiving and Communication System (PACS), have increased the demand for the collaborative sharing of patient clinical data among healthcare professionals. However, the degree of technological development of Brazilian health services is highly heterogeneous and, in this context, the medical record is usually one of the last to be computerized. This is mostly due to economic and cultural problems related to the resistance to informatics by the possible users, difficulties or lack of access to software, and even presumed legal and/or ethical impediments.

Research on healthcare information systems in the cloud has been intensified because of the need for technologies that may be considered both attributes and characteristics of the environmental context. Nonetheless, in general, studies in this area are based barely on the information contained in the current legislation and does not encompass observation reports of the real healthcare environment. This makes it difficult to understand the actual needs of the users so that the implemented solutions can be applied in an efficient way.

Based on the above, the objective of this study was to understand how the BHU controls access to patients' medical records, to verify the occurrence of the use of paper and digital medical records, and to compare the reality with the current legislation.

This paper is structured divided into six Sections. In Section 1, the challenges of the healthcare environment regarding medical records are presented. In Section 2, related studies are presented. In Section 3, the concept of the patient's electronic medical record is presented. Section 4 describes the methods used in this qualitative research. In Section 5, the results obtained through the qualitative research are presented, and finally, in Section 6, the work is concluded.

II. RELATED WORK

The main objective of the research projects using qualitative research around the world is to understand the reality from the point of view of the individuals involved in that environment or situation.

The qualitative research with semi-structured interview presented in this study identified, through the workers of the basic healthcare units, the most important characteristics that should exist in the control of access in a web system containing

the electronic medical records. The related works described in this section are related to this work because they present qualitative research methodologies that aim to know the reality of the healthcare environments and the patients.

Miller [1] used the methodology of qualitative research through the semi-structured interview and sought to evaluate the acceptance of the use of health websites or portals containing the electronic medical records. The results of these studies showed concerns about the consequences of improper access such as alteration of medical records by unauthorized persons and exclusion of treatments and medications prescribed by physicians.

The results of Miller's research can also be noticed in this current study. The research demonstrated that the medical records are exposed in inappropriate places where authorized and non-authorized people constantly pass through to handle the medical records. This concern about improper access was also evidenced through the responses of some interviewees indicating that many medical records are lost partially or totally.

Web information system for access to electronic medical records has been developed around the world. In his work, Shimada [2] does a qualitative research with transversal analysis to identify the patient's adoption of the web platform containing the electronic medical record.

The results of the study revealed that patients with life-threatening condition and those in need of intensive treatment are likely to adhere to the use of eletronic medical records on the web. On the other hand, patients who are not critically ill or patients who are only in a regular clinical follow-up are less likely to use a web system containing their electronic medical records.

These results were not evidenced in this study since the electronic records in the observed BHU are not implemented and patients do not have easy access to them. Patients need to undergo bureaucratic authorization requests to access the document, even if the current legislation ensures them the right to obtain it.

Lester [3] conducted a literature review with the analysis of 34 papers on the benefit of personal health records or electronic medical records. The results identified concerns related to patients' understanding of the medical records, legal liability, response time of access providers, and the need for the US health system to ensure the protection of information, its usefulness and ease of access.

The results evidenced in this review corroborate with those found in this study, since the same indications cited above were listed as concerns of the health servers about the handling of the paper medical record and indicated as possible benefits of the medical records computerization.

III. ELECTRONIC MEDICAL RECORD (EMR)

The EMR was developed by physicians and nurses to systematically as a way of remembering the clinical facts and events of each patient.

The EMR represents the best means of communication between the healthcare team members responsible for the patient assistance. The EMR subsidises the continuity and the verification of the evolutionary state of the patient's health

condition and in a more comprehensive perspective can also be used to assess procedures and their results.

Over the evolution of the EMR, in 1997, the Institute of Medicine defined it as [4]:

An electronic record residing in a system specifically designed to support users by providing access to a complete set of accurate data, alerts, decision support systems and other features such as links from displayed information to pertinent literature.

As Patrício [4] states, efforts began in the 1990s in isolated centres in Brazil for the development of electronic medical records. Due to the need of standardization of the medical record, the Ministry of Health proposed in 2002 the minimum information about the patient that should be included in the EMR and the entities that should supervise its filling.

According to article 5 of the Brazilian Federal Constitution [5], all Brazilians are ensured of the inviolability of the right to the security of their information. The CFM (CFM, Portuguese for "Federal Council of Medicine"), through the CFM Resolution No. 1.331 / 89, Ordinances No. 1.638 / 2002 and No. 1.639 / 2002, informs how the temporality, custody and handling of the medical records have to be processed, as well as how the computerized systems have to be used. These resolutions and ordinances ensure: authenticity, integrity, confidentiality, privacy and document storage.

Following the advance of the EMR, the Federal Council of Medicine created the CFM Resolution No. 1.821 / 2007, which approved the technical standards for documents digitization and the use of computerized systems for the storage and handling of patient records, authorizing the elimination of the paper records.

After the resolution, all healthcare professionals can check clinical information from patients, regardless the professional's location. Technology provides integration and cost savings. However, the authentication and authorization process has become a major challenge in these domains.

IV. METHODS

In this study, a qualitative study was conducted with a semi-structured interview at BHUs in Londrina - Paraná (Brazil). The information collected from the interviews can be extrapolated to the other Brazilian locations, as Brazil does not have any national unified system that meets the demands and characteristics required for a computer access control system, and also because there is no sharing of information between BHU and Hospitals in Brazil. In order to carry out this study, an authorization from the Municipal Health Department was obtained and approved by the Ethics Committee of the Evangelical Beneficent Association of Londrina - AEBEL - (CAAE 51829215.5.0000.5696); This study is also in accordance with the Resolution No. 466/12 of the National Health Council [6].

For data collection, a semi-structured interview schedule was elaborated and submitted to content analysis by experienced judges in the area, who analyzed the content of the questions and whether they were adequate and coherent to what was proposed. Then, three preliminary interviews were carried out to calibrate the researcher and verify the application of the questionnaires for the purpose of possible readjustment. There was no need to readjust the interview schedule questions

and these preliminary interviews were discarded from the final results.

The final script contained 17 questions, five of them related to the characterization of the participants (age, occupation, function in the BHU, time working in that function, length of higher education course) and the others were related to the medical record use (use of paper and electronic medical records, purpose of medical records, frequency of use, required information and registration, initial process of medical records, difficulties in handling and interpretation of the recorded information, transfer of medical records to other healthcare units and homes, professionals who access these medical records, document archiving and collection).

Next, one BHU from each region of the city - North, South, East, West and Centre was drawn. For each selected BHU, the respective coordinator was contacted in order to explain the purpose of the research and to schedule interviews with the professionals.

The interviews were conducted with healthcare professionals and administrative technicians who agreed to voluntarily attend in this study and signed the free and clarified consent form.

The number of interviewed individuals depended on the saturation of the interview. Individuals from different areas that access the medical records in different ways were interviewed until the answers began to repeat themselves, which occurred after three to four interviews in each BHU, having been safely extended to 5 to 6 interviews in each of them, with a 15 minutes average duration each, totalling 29 interviews.

Subsequently, the process of literal transcription of the recordings of each interview began. After the transcriptions, a content analysis was performed as proposed by Bardin [7]. The author describes the content analysis as "set of techniques of communications analysis that uses systematic and objective procedures to describe the content of messages, indicators (quantitative or not) that allow the inference of knowledge regarding the conditions of production/receipt (inferred variables) of these messages".

After the literal transcription, the following categories were established: 1) Medical records information, 2) Advantages using of handwritten medical records, 3) Disadvantages of handwritten records, 4) Sharing and transfer of medical records, 5) Use of the medical records in home care, 6) Release of medical records to the patient, 7) Collection of medical records.

The observation was also made aiming a real participation of the researcher in the researched community and through the senses as seeing, hearing and examining facts or phenomena to obtain certain aspects of reality. The observation technique has the objective of observing the subjects' environment and describing it from the researcher's perspective. In this work, the unstructured observation was chosen for data collection. The analysis included aspects as coverage area, address changes, systems, paper medical records, eventual medical records, patient care, medical records room, lost medical records, medical records exposure and exposure of BHU servers.

V. RESULTS

The qualitative research presents a methodological rigor that must be followed for its application. Among these rigors are the semi-structured interview and the observation process that is done by the researcher in the study environment of the research.

The standard statistic for this type of research is the descriptive one. 29 subjects aged 20 to 58 years were interviewed, the average age being about 38 years. The occupation of the interviewees were: interns - 1 (3.44%), administrative technician - 2 (6.89%), oral health technician - 1 (3.44%), nursing auxiliary - 14 (48.27%), physician - 1 (3.44%), community agent - 4 (13.79%), nurse - 5 (17.24%) and physiotherapist - 1 (3.44%). Working time in basic health units varied between 1 month and 30 years, the average time spent working in a BHU was 8 years. The working time in the specific BHU varying between 1 month and 27 years, the average time spent working at that specific BHU was 5 years.

The employees in administrative positions, administrative technician and accountant, had restricted access to the medical records - they accessed only the patient's registration data, the other positions had full access to the medical records. All employees use the medical records daily and for every single patient. In this Section, the results found in the semi-structured interview and on the observation are described.

A. Semi-structured interview

The categories resulting from the process of analysing interviewees' responses are described below. The quotations displayed in quotation marks represent the words of the interviewees, respecting the way of speaking of each one.

1 - Medical records information: In this category, the interviewees' statements about the notes contained in the medical record and the difficulty with the lack of annotations pertinent to the patient's medical history are described: "All the patient's medical history is in the medical records, right? (...) Ideally, each care or service should be reported. This does not always happen. There are things that are abbreviated, others are just not written (...)" (interviewee 4).

By these reports, it was possible to notice that many important information to the medical record registration are omitted. As a consequence, it puts the next heath care at risk. It also can affect the search of the previous patient history if this one presents a future disease, as well as hamper the diagnosis of possible drug interactions that may interfere with the patient's health. Furthermore, vaccines reapplications can occur if there is a missing registration of vaccinations or if a new request has been made because no previous requests are found.

These reports indicate not only that the patient health is at risks but also the misuse of public money, since due to a lack of information the patient may unnecessarily go through the same vaccines or health unnecessary examinations [4].

2 - Advantages of using handwritten medical records: In this category, the interviewees highlight the difficulties dealing with poor and outdated electronic equipment and also indicate that the fact that handwritten pleases some people [4]: "If the medical record was electronic, under the conditions we have today, it would be a bit complicated because there is no enough computers, the system is very slow"(interviewee 5).

Regarding this topic, some individuals reported the precariousness of the computer equipment, the difficulty in handling

the technology and the software, plus the shortage of equipment that suit their needs. In general, there are little equipment available and the ones available, according to the interviewees, are in a state of dereliction and outdated and the people who are supposed to use the system do not receive adequate training for the use of the equipment and software.

3 - Disadvantages of handwritten records: There are more reports in this session and they generally talk about the spelling unintelligibility, the loss of documents, difficult handling the records and the storage insufficiency [4]. "But sometimes we are looking for the result of an exam to know if the physician has already seen it and the difficulty is huge. The difficulty in searching, reading, interpreting." (interviewee 1). "The patients do not know what medication they are taking, so they come to the BHU to collect the medication, you take a look at the previous prescription and sometimes it is unreadable or there are some not listed medications" (interviewee 3), "A major problem is the individual's handwriting" (interviewee 29), "(...) besides the loss of document there are a lot of new sheets so we kind of just clip them together(...)" (interviewee 1).

In this category, many different points are cited as disadvantages. The main concern among the interviews was the fact that the colleagues' spelling was sometimes unintelligible. One of the interviewees reported, after the recorder was disconnected, that in some cases when it is not possible to understand the handwriting, the nurses search on "Google" possible names of medicines used for that problem indicated by the doctor. This practice results in a big risk to the health of the patients who go through the proposed treatment without knowing what is being given to them, trusting the service and believing that the treatment is being given by competent professionals.

Another issue mentioned is the difficulty in handling the medical record due to the large number of pages attached to it, this situation facilitates the loss of information and also the detachment of parts of the medical record. Moreover, the collection, more detailed in category 7, was indicated as a disadvantage due to the difficulty in finding the medical record and when not found it is necessary to open a new medical record titled as "eventual". The same patient may have several "eventual" folders. The original medical record and the eventual folders in some cases are attached to the same medical record when it is found but in other cases this records are not found.

4 - Sharing and transfer of medical records: In this topic the interviewees report how information sharing occurs between BHU and hospitals. "But here in Brazil it does not exist. There is a different medical record to each place the patient is assisted" (interviewee 19); "The city hall is not paired with the hospitals of the region. We do not have access to their medical records." (interviewee 20).

The interviewed individuals report that there is no sharing of information between BHUs or hospitals. An individual can present a proof of address and register in several regions of the city and in several hospitals using the same SUS (SUS - Portuguese for "Brazil's Unified Health System") identification card and have a distinct medical record in each different health environment. Likewise, even without a proof of address, this individual, if necessary, may attend several BHUs who will register their visit in an "eventual" folder and their complete medical record would be in their original BHU.

In this aspect of the problem, it is important to point out that the lack of adequate sharing between the BHU and hospitals leads to a poor service provided, it offers risk to the patients in a state of fragility. As an example, if a victim of an accident arrives at a hospital incapable to report its previous history, this person may suffer complications due to the lack of important information provided for the maintenance of its life. This may also facilitate fraud and inappropriate use of the health system [8].

5 - Use of the medical records in home care: This topic describes the management of medical records in external use situations. "We write observations down. There is an annotation notebook. When we come back to the BHU we transfer the information to the medical records." (interviewee 18), "We separate the medical record and carry it with us, particularly during medical visits. In nursing and community agents visits, they do not carry the records along" (interviewee 28).

In this category, two different situations are observed: professionals who remove the medical records from the BHU, leading to the risk of loss of the document, and those who just write down the information when they return to the BHU, may losing some relevant information.

6 - Release of medical records to the patient: This item reports the procedure for the removal of the medical record by the individual or family member. "The patient goes to the administration department to fill out a form requesting the medical record. This request goes to the "Vila da Saúde" (freely translated as "Health Village"), they run an evaluation process and after the "Vila da Saúde" sends to the patient a copy of its medical record" (interviewee 5), "The family does not have access to medical records" (interviewee 6), "We only provide a copy of it if there is a judicial request" (interviewee 9).

7 - Collection of medical records: Respondents reported the use of a catalog system that can be confusing and bring the system into disrepute. "When (...) the person ID, (...) is, for example, 1505 (...) we know it ends in 5. So, we look for the lowest number of 4 and find the records. (...) Sometimes you do not find it though. (...) There are those records placed in the visiting folder, because they are hospitalized (those lying on a bed), and there are the pregnant women who have separated records" (interviewee 24).

When the patients first look for the health service, they are registered in an internet system called e-SUS using their personal data and address. The system generates a unique ID number. From this ID a page header is generated and then printed, giving rise to the medical record.

The medical record is stored from its final number, 0 to 9, which represents the quadrants of the physical shelves of the storage room of each BHU. Within each quadrant the medical records are organized manually from the lowest number to the highest, which may vary from unit to thousand, for example: at the end 5 there are the medical records with IDs 5, 15, 105, 1005, 10.015 and so on.

This arrangement can be even more complicated in the separation of pregnant woman or a diabetic and hypertensive person. For instance, a patient who is hypertensive and diabetic

would be registered in which part of the storage, among diabetics or among hypertensive? This type of classification can hamper the management and searching of the medical records.

B. Observation

In the course of the observation it was found that:

1 - Coverage area. Each BHU provides assistance to a specific area defined by the Unified Health System. This coverage area corresponds to the boundaries of the neigh-bourhoods surrounding the BHU. All patients residing within this defined area can be assisted and monitored through their medical records kept at their specific BHU.

2 - Systems. The metropolitan region of Londrina possess in digital format only the basic register of the citizens of the region in the e-SUS web software (integrated with SUS) and Saúde Web (software integrated to e-SUS and focused on vaccines and some exams in the health area).

This register is restricted to the identification number - ID, name, date of birth, gender, National ID, marital status, city of birth, telephone number, home address, zip code, other contact numbers, name of the person responsible for supervision and safety (if applicable), occupation, place of work and vaccine registration.

3 - Paper medical records. When the patient is assisted in the UBS for the first time, its personal information available in the e-SUS system is confirmed with the patient or responsible person, from that moment a proof of address is requested to the patient to verify if it lives in the area of coverage of that specific UBS.

After this verification, the technician informs that within 24 hours he/she will personally go to the patient's residence to confirm the address. Next, a form with the basic patient data is printed and placed in a new envelop, this envelop will have the patient's ID manually written on the front of it. From that moment on, every time this patient comes to the BHU, a single sheet with the annotations of the appointment is inserted in this envelope. These sheets have no header, they are white A4 papers with lines. It is worth mentioning that the patient's data are only on the first sheet, the one which starts the medical record. The medical record, then, is formed by this initial sheet with the basic data and the other single sheets with the appointments' information.

4 - Eventual medical record. In some situations the BHU receives patients who do not reside in its area of coverage. As BHUs are not allowed to deny assistance, a temporary medical record is made. This type of document is called an eventual medical record. The eventual medical record is a register with the basic personal data of the patient and will also contain the information about the service performed at BHU.

They are kept in the BHU. This record is transferred to another BHU (the BHU in the patient's area) only when requested. It has been found that this medical record is most often forgotten by patients and is not transferred.

5 - Home address change. When a family or patient changes its home address beyond the BHU coverage area (moves to another location), the patient must notify the other BHU (the one that provides healthcare at their new address) to request the transfer of their medical records. In this case, these medical records are stored in specific boxes in the BHU that provided this service. If there is no request for transfer this file by the corresponding BHU of the patient's region, this health history will be lost.

6 - Services. It has been verified that during the operating hours of the BHUs the medical records are exclusively managed on paper. Each BHU receives an average of 400 to 1000 patients per day, depending on the period of health surveillance or the absence of epidemics.

In order to provide care for each patient, the BHU applies the following procedure: first, the technician consults the patient's ID in the web system and confirms the personal data. Secondly, the server asks the patient to wait in the waiting room while the technician goes to the room of the medical records to retrieve the file with the respective ID and after finding the medical records they proceed with the service.

Searching for the medical record can be quick if the last person who handled it saved the file in the correct location. If the patient resides outside the coverage area of this specific BHU, he/she will be advised to go to another BHU, but if it is an emergency the patient will be assisted in this BHU.

7 - Medical records room. The average size of the medical records room in the BHU is approximately 15m2. There are vertical and horizontal wood shelves forming fixed squares on the wall. These squares are called "quadrants" by BHU officials. The quadrants are sorted from digit 0 (zero) to 9 (nine), they are called "finals". These final numbers represent the last ID number of each patient and they are used to organize and store the medical records, for example: if the patient has an ID 5, ID 1205, ID 1000005 or ID 15, it will be stored in the quadrant of number 5. Inside each quadrant, the medical records are ordered from the lowest number to the highest.

In most BHUs, the medical records of those who are hospitalized (those lying on a bed) are placed in plastic or cardboard boxes separated by numerical order and not by final number. In some BHU, patients with diabetes and high blood pressure are also separated into boxes and are not in the quadrants.

In the course of the everyday healthcare, the already used medical records are placed in a box and at the end of the day they are stored in their respective quadrants or specific boxes.

As verified each BHU has approximately 25,000 possible patients in its coverage area, which generates an average of 10,000 to 20,000 medical records per BHU. Each medical record has an average of 20 sheets. However, some medical records have up to 200 sheets. As a result, the employees reported that this type of organization is sometimes inefficient and many medical records are lost or damaged in this process.

8 - Loss of medical records. When the administrative technician does not keep the medical record at the correct place (quadrant or specific box) after a service or at the end of the day, a serious problem is caused.

The probability of this medical record disappears is very high. In cases of loss of medical records, the technician normally takes an average of 15 minutes looking for it before give up trying to find it. In these cases, a new medical record is made with the patient's cadastral data.

Afterwards, during the service the technician seeks to retrieve the most recent history of the previous visits, such

as: medical prescriptions, health problems and treatments. As verified, the loss of medical records is constant, including those older than 5 or 10 years.

9 - Exposure of medical records. There is a constant patient flow during BHU's opening hours, especially in poor neighbourhoods and epidemics periods.

What has been noticed during the BHU's operation time is the onerous and frequent search of medical records, besides its exposure due to poor structural and organizational conditions of the BHU.

In some BHUs it was observed that the medical records already used were kept in desks, with no organization, in the hall where patients transit before and after the appointments or they were all placed in boxes by the hall and then stored at the end of the day, after the working hours.

As stated previously, the medical records have a header with identification only on the first page and the rest of it is made by just white sheets with lines that do not identify the patient, which facilitates the loss of part of the medical record or the entire record itself. In other BHUs, there was a technician allocated to work all day storing medical records, it corresponds to at least one less employee treating the patients.

10 - Exposure to health risks for employees and patients. The fact that medical records are on paper puts the health of BHU workers at risk. As a consequence of the constant patient flow and the costly search/loss of medical records, the health carers cannot invest much time in reading the patient's history. Likewise, there is no place in the medical record highlighting the information with the highest level of relevance.

The servers commonly retrieve only the latest information about the patient, from the latest sheet. This fact exposes them to situations of risk. As reported in an interview, the nursing technician Maria (fictitious name) was told by a nurse friend that the patient she dealt with was diagnosed with HIV infection only after she gave the patient an antibiotic injection. This situation occurred because Maria did not look all over the patient's medical record, she looked over the last sheets only.

VI. CONCLUSION

This article presented a qualitative research carried out in the context of the Brazilian Basic Healthcare Units, aiming to understand the reality of the manipulation processes of patients' medical information by health professionals.

This research rigorously followed all the necessary procedures to apply the qualitative research to fulfil the objectives of this work.

This study made it possible to experience the real environment of BHUs health and as the control of access to the patient's medical records happens, verifying that the medical records are exclusively in paper. On the other hand, the identification of the patient and some records of exams and vaccines are recorded in Electronic format, but employees do not always include these data in the system.

The research shows how the patient data is managed, who can access/change them, how they are used and for what purpose. The interviewees' reports revealed situations that reflect problems in the area of systems integration, access control, privacy and information storage.

It was observed that the absence of a computerized health system integrated between the BHUs and hospitals impairs the patient care, increasing the waiting time for service, causes the patient to need to report his previous history in each appointment at different BHUs (and their verification tests can be accessed), generating a greater demand for time to each service, unnecessary spending of public money for having to redo exams that have already been carried out, which leads to delays in general care, increasing queues and frustration with the health system.

The BHU routine demonstrates the fragility of safety in accessing the patient's medical records. Due to the physical conditions of the BHU there are no appropriate places for the medical records. They are placed in makeshift halls, inappropriate shelves, counters and in many improper places in the BHU. There is a regulation that determines which people can write down in the medical record and/or read its information. However, there is no way to prevent undue access.

This research will serve as a subsidy for the elaboration of computational models of electronic medical records and of access control to the information that are close to users' needs, promoting greater consideration of the confrontation of the reality found in the environment against the current legislation in the country, as well as other countries that use electronic medical records in their clinical-hospital practice.

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