## INTRODUCTION

The ethical requirement of confidentiality for doctors was established from the beginning of medical practice with the Hippocratic Oath, which states that "*what I may see or hear in the course of the treatment or even outside…in regard to the life of men, … I will keep to myself holding such things shameful to be spoken about*" (Hippocrates as cited in Markel, 2004). The World Medical Association ratified the confidentiality rule in the *Geneva Declaration* (1948) and in the *International Code of Medical Ethics* (1949).

The right to privacy and access to medical records are among the most heavily protected rights. Therefore, many states impose severe sanctions when rules are violated. At the European level, member states are bound by the General Data Protection Regulation 2016/679 to contemplate the provisions that are related to the processing of personal data (European Union 2016). Although it is a common rule, each of the member states themselves establish multiple protection mechanisms through laws, statutes, civil or criminal codes or, in jurisdictions such as the United Kingdom, in common law (European Commission et al. 2018). The present study was performed in Spain, where the right to privacy is included in a basic way in the Spanish Constitution (Cortes Generales 1978). More specifically, the Code of Deontology (Medical Association of Spain 2011) highlights the obligation of doctors to respect the confidentiality of patients as a general rule, but some problematic situations may arise in which this obligation may be overridden within certain limits (article 30). Further, Law 15/1999 on the protection of personal data (Jefatura del Estado 1999), and Royal Decree-Law 5/2018 (Jefatura del Estado 2018) protect the handling of health-related data in a special way. More specifically related to the health field, Law 41/2002 indicates the right to privacy and confidentiality of patients, the rights to information and informed consent, and access to their data and clinical history. In fact, the duty of confidentiality may be overridden when there is an explicit consent from the patient or in case of need, but proportionality principle regarding confidentiality principle and any other (i.e. third-party damages), must still be considered (EuroSOCAP 2006).

Medical confidentiality has always been considered more than just an issue for medical professionals; it is also a matter of major social concern due to the potential consequences of noncompliance. Thus, confidentiality is not a static concept in time but must be adapted to social changes in a manner that this obligation is not considered any more to be an absolute value but a relative one, that can be circumvented in favor of third parties or

general interests (i.e. to avoid health damage or to solve a crime) (Rieder et al. 2016). The duty of confidentiality is not only based on the observance of the privacy of the individual but also on how essential it is to completely respect such confidentiality, thus creating a relationship of confidence and collaboration between doctor and patient (Mlinek and Pierce 1997).

For years, different observational studies have shed light on situations that affect or even endanger patient confidentiality, both from the actions of doctors and of the healthcare infrastructure (Beltran-Aroca et al. 2016; Mlinek and Pierce 1997; Olsen and Sabin 2003; Ubel et al. 1995; Vigod et al. 2003;).

The principal objective of this work was to administer a questionnaire to analyze some aspects of medical practice that are related to the confidentiality of patient data with regards to the training, behaviors and opinions of doctors in the different Clinical Management Units (CMUs) of a third-level hospital in Córdoba, Spain. The present study aimed to define the problem of respect for patient confidentiality and to determine whether the opinions of the professionals about patient confidentiality corresponded with opinions that were reported in a previous study conducted at the same center (Beltran-Aroca et al. 2016). In addition, some measures are proposed to increase doctors' training in the theoretical knowledge of confidentiality, in knowledge about the consequences that arise from the violation of patients' confidentiality, and how to analyze the aspects that are related to the organization and infrastructure of the center that may have an influence on confidentiality, with the aim of proposing actions that can improve these problems.

## MATERIALS AND METHOD

The present work was based on a questionnaire that was administered to both consultant and resident members of the medical staff belonging to any CMU at the hospital and with at least one year of professional experience. The survey was conducted at a third-level hospital with 1,197 beds and 1,104 doctors, according to recent data, with a target response rate of over 15% of the population so that the study sample could be considered a representative sample.

The questionnaire that was used (Supplementary File) was based on one previously published by Marga Iraburu and colleagues (Iraburu et al. 2006), but it was modified in terms of findings that were obtained from the aforementioned previous project (Beltran-

Aroca et al. 2016) that also was performed at this hospital in Córdoba between 2010 and 2014. The questionnaire was anonymous and did not permit the identification of the respondents, although a series of sociodemographic characteristics was collected to allow for subsequent analyses of the results; the sociodemographic data that were collected include sex, age (categorized by tertiles; 30 years or under; between 31 and 50; 51 or older), years of practicing medicine (categorized by quartiles: between 1 and 3 years; 4 and 9; 10 and 28; 29 and 45), professional typology (consultants or residents), and type of CMU to which they belong (medical, surgical, medical-surgical, or other). Each questionnaire consisted of 12 multiple-choice and closed questions (2 questions in one of the options permitted the addition of a free answer) that were classified in 3 blocks. The first block probed the doctors for their knowledge about and training in theoretical issues regarding confidentiality (questions 1-4). The second block referred to the behavior and attitudes of doctors in their handling of clinical documents and situations in which confidentiality might be compromised (questions 5-8). The third block asked their opinion on their actual work center (questions 9-12). Once the questionnaire was compiled, a specific scoring system was designed to determine whether the respondent gave the most appropriate answer from an ethical point of view to each of the questions in the first two blocks; the doctors' knowledge and behavior/attitudes affecting confidentiality had a possible score of between 0 and 15 points, and between 0 and 11 points, respectively. Finally, these values were normalized to a 10-point basis to make it easier to score each questionnaire.

No validated measuring instrument was used, although a first draft of the questionnaire was submitted to a panel of experts that was composed of 10 doctors. After receiving their suggestions for revision, the questionnaire was revised and modified. Next, and after obtaining the approval of the Ethics Committee on Research in Córdoba, the questionnaire was evaluated by means of a pilot survey from 30 doctors at the hospital, resulting in another series of changes to the questionnaire that were related to some of the practical aspects of its administration. To recruit participants, the final version of the questionnaire was sent to medical staff of the hospital in a Google™ form format by an email in which the details of the study were explained and a web link was attached in a similar manner to previous studies (Barnable et al. 2018). Once the questionnaire was filled in, the anonymous responses were stored in an automatically generated computerized form that only the researchers in charge of the study had access to.

At the end of the data collection phase, the statistical analysis was performed with the PASW Statistics 20 software (IBM-SPSS®) for Windows. In addition to the descriptive analysis, a comparison of proportions for the qualitative variables between the different groups was made using the chi-square ($\chi 2$) test for contingency tables, applying the Finner correction for multiple comparisons. If the values that were calculated in any one of the boxes were below 5, the Fisher exact test was employed. In the case of continuous variables, comparisons of average values were conducted by one-way analysis of variance (ANOVA), applying the Games-Howell and Scheffé post hoc tests. To determine the variation between the scores that were obtained in the blocks and the rest of the variables, the linear regression test was applied. The Spearman correlation test was also made on the continuous and ordinal qualitative variables. Statistically "significant" values were those with a confidence level over 95% ($p<0.05$).

## RESULTS

Of the 1,104 doctors on staff at the hospital, 18.78% (N=200) answered the questionnaire. Among the participants, 62.5% (n=125) were consultants in a specific area, and the rest of the respondents were residents (n=75; 37.5%). The mean years of professional practice was 14 ± 12.5 years (yrs.), with a range from 1 to 45 yrs. (Table 1).

*Table 1 here.*

### Knowledge of doctors with respect to confidentiality

#### *Knowledge of legal and deontological norms*

In the first question, a series of hypothetically misleading situations was proposed related to patients' confidential data, and of the response options provided, the most adequate answer was that none of the response options was correct. Thus, 36.5% of the respondents gave the correct response, and there was a statistically significant difference (p=0.010) between the performance of the men (45%), compared to the women (25.3%). A very high percentage (up to 58.5%) responded that the doctor could reveal a patient's confidential data in the case of a notifiable disease, with a statistical significance (p=0.005) that was dependent on the sex of the doctor (women 71.3% *vs.* men 48.7%). However, most of the participants answered that the patient's death did not exempt them from their duty of confidentiality and that doctors were under an obligation to preserve

this confidentiality in any context that extended beyond their working duties (n=199; 99.5%).

With respect to question number 2 – legal and deontological norms in the workforce – 54.5% of respondents answered that they were aware of the existence of Law 41/2002 on patient autonomy and clinical history, although only 18.5% could provide sufficient detail about its contents. Regarding the latter, similar phenomena occurred with respect to Law 15/1999 on the protection of personal data and to the Code of Medical Deontology, since 59 and 54.5% of respondents, respectively, noted that they knew that these guidelines exist. However, only 22% of participants replied that they had sufficient information regarding the contents of this law, and a slightly higher percentage (25.5%) were sufficiently informed of the Code of Deontology.

*Consequences of and situations regarding breaches of confidentiality*

On probing in question 3 what consequences would be incurred upon a breach of patients' confidential data, only 19.5% gave the correct answer by marking all the options that were proposed; however, the majority (99%) did know that some legal consequence or ethical infraction could result from such a breach. In a breakdown of the results there is a striking percentage (61%) of respondents who did not indicate imprisonment as a possible sanction, although up to 77% of the participants knew that violating the confidentiality of a patient could result in a prohibition against practicing medicine.

Law 41/2002 defines "clinical history" (CH) as a set of documents relating to the medical attendance processes of each patient, the aim of which is to maximize the integration of their clinical documentation (Jefatura del Estado 2002). In this regard, question 4 asked the respondents to indicate instances in which confidentiality can be breached, and 51.5% gave the correct answer that both the indiscriminate use of information managers and placing printed CH in communal areas or in places that can be easily accessed by any person are a violation of patient confidentiality. In addition, the participation of students in drafting the medical records and physical examination of patients would be an infringement of confidentiality if express consent from the patient had not been obtained. With regards to the latter, significant differences were observed ($p=0.049$) between the types of professionals, with a higher percentage of correct answers given by the consultants (64.8%) than the residents (50.7%).

**Behavior and attitude affecting confidentiality**

*Information management in risky situations*

In relation to question 5 about the places where doctors usually comment on or exchange information about their patients with other colleagues who are not treating the same patients, only 20% correctly replied that they did not engage in this behavior. Here, significant differences were observed (p=0.015) in the extreme age groups (≤ 30 yrs.: 10% *vs.* ≥51 yrs.: 29.3%) (Figure 1); regarding their years of practice (p=0.030), this response was less frequent among the participants who had been practicing between 1 and 3 yrs. (6.9%) (Figure 2), and this response also varied depending on the type of professional (p=0.034) (residents: 12% *vs.* consultants: 24.8%) (Figure 3).

In question 6, individuals were asked whether they would supply information about a patient to a colleague who is acquainted with that patient but who is not involved in the patient's medical treatment; 38.5% of participants gave the correct answer that they would not share this information; 10% of respondents indicated that they would directly supply this information, while 51.5% would give it but would remind their colleague to maintain the patient's confidentiality.

*Protection of information in daily medical practice*

Among the behaviors that were described by the respondents in question 7, when visiting their patients in either their surgery or in the hospital ward, 73% of respondents marked the three presented options as the correct answer; however, the most frequent response was to ensure that those persons accompanying the other patient were not in the room (89.5%). In this regard, 83.5% of participants answered that they would ensure that no person who was not involved during the patient's visit was present in the surgery when a patient's case was being discussed; this behavior was more frequent in the older age group than in the younger one (≥51 yrs.: 93.1% *vs.* ≤30 yrs.: 75.7%; p=0.024), as well as in the area consultants (consultants: 88.8% *vs.* residents: 74.7%; p=0.018). Similarly, it was found that this behavior was less customary in those medical professionals who had been in practice for fewer years (1-3 yrs.: 72.4%) than in the more veteran groups (*vs.* 10-28 yrs.: 90.7%; p=0.039) (*vs.* 29-45 yrs.: 91.1%; p=0.039). Less frequently, 83% of participants answered that they ensured that the door of the surgery or hospital room was shut when visiting their patients, especially among the men (men: 88.5% *vs.* women: 75.9%; p=0.025).

When they were asked in question 8 whether they gave information by telephone to their patients, 25.5% responded that they acted appropriately and always gave this information if they had the consent of the patient, although a high percentage of respondents (67%) said they never provided information by telephone to their patients.

**Opinion of the professionals on their work center**

*Use of medical data considering the location*

When the medical professionals were asked in question 9 for their opinion on why relatives of hospital patients are usually provided information in the hospital corridors, 78.5% answered that it was due to the lack of another suitable place to do so, and 26.5% noted a lack of time. Other reasons that were provided in the free answer (4.5%) included poor training, laziness, a hospital habit, too many patients, little time or few staff. 3% of respondents considered that it was not necessary to provide confidential information in a different location, and 2.5% had never seen anybody providing information in the aforementioned places, with this opinion being given by a group of women (5.7%; $p=0.025$).

The responses to question 10 were reasonably distributed. Although 36% of the doctors were of the opinion that if they were sick and they did not want their diagnosis to be known, they would continue to be treated in their own hospital, and 24% of the doctors would go to another health service hospital. The rest of the respondents (20.5%) answered that the medical center did not really matter.

*Measures to be considered in the present center*

In question 11, 35.5% of the respondents answered that the training of doctors on aspects of healthcare law and ethics was the most important measure that should be adopted by a hospital with respect to confidentiality, although 29.5% of participants also emphasized the need to guarantee the security of computerized clinical records, and 22.5% vouched for setting aside rooms where information could be given to families. A lower percentage of doctors made their own different proposals, suggesting to limit the number of visits to patients to make it easier to examine them, to refrain from using the public address system to encourage decorum in the general public, and to promote the use of individual patient rooms.

Finally, in question 12, all the participants agreed that in their hospital some situations had arisen in which confidentiality was put at risk, and 51.5% of respondents reported that these situations occurred frequently. The rest of the participants were distributed similarly between very frequent and infrequent, with a slight predominance of the latter (25.5%).

**Scores obtained by the professionals**

The mean score that was obtained by the respondents in the block of knowledge of confidentiality was 6.80 points ±1.45, and the mean score of the behavior and attitudes block was 6.65 points ±1.80 (both out of a maximum of 10 points). No statistically significant differences were observed that showed any correlations between both blocks (r= -0.10; p=0.084).

*Scores depending on the professional characteristics of doctors*

The scores varied depending on the characteristics of the professionals (Table 2), and statistical significance was only found in the behavior and attitudes block. The area consultants obtained better scores ($p<0.001$), with doctors of ≤30 yrs. of age scoring lower (*vs.* 31 and 50 yrs. p=0.029; and ≥ 51 yrs. $p<0.001$), as well as doctors with between 1-3 yrs. of practice compared to doctors with between 10 and 28 yrs. (p=0.006) and 29 and 45 yrs. in practice (p=0.009).

*Table 2 here*

The univariate simple linear regression analysis gave statistically significant differences in the scores of the behavior and attitude block, and a low correlation (r=0.239; p=0.001) was observed between the age of the doctors and their scores; namely, doctors ≥51 yrs. of age and those with ages between 31-50 displayed an increase of 1.211 points ($p<0.001$) and 0.805 points (p=0.006), respectively, compared to doctors ≤30 yrs. of age. A low correlation was also shown (r=0.234; p=0.001) between years of practice and score in this block. An increase was demonstrated in the scores of the groups of doctors who had practiced medicine between 4-9 yrs. (0.671 points; p=0.056), and those who had practiced between 10 and 28 yrs. (1.179 points; $p<0.001$), and 29 and 45 yrs. (1.185 points; p=0.001), compared to doctors with between 1 and 3 yrs. of practice. The men obtained lower scores than the women (-0.003 points; p=0.991), and so did the residents vs. the area consultants (-0.969 points; $p<0.001$).

## DISCUSSION

### Knowledge of doctors about confidentiality

Having a sufficient awareness of the principal legal aspects of the confidentiality of the patients and their clinical information would help not only to avoid legal risks but also to act in conformity with the ethical values that their profession commands. Over half the participants declared that they at least knew about the existence of the basic regulatory norms on the confidentiality of the patient, and they knew about the Code of Deontology (Organización Médica Colegial of Spain 2011) at percentages that were slightly higher than those that were obtained in previous studies (Iraburu et al. 2006). It should be acknowledged that the present study was performed only with the medical staff, who have an assumed wider theoretical training, and the study was focused on the ethical problems that can arise in clinical practice, although no differences were noted between the doctors in terms of their age or category. Very few of the doctors answered that they had a deep knowledge of confidentiality or the Code of Deontology (Organización Médica Colegial of Spain 2011). This is reflected in the fact that, in this survey, doctors could generally point to certain situations in which it is permitted to divulge confidential patient data and those in which it is not, and these results coincide with previous studies (Grady et al. 1991). However, individuals in this study expressed uncertainty about concrete actions, such as whether to reveal notifiable diseases (the onus of whose obligatory declaration lies with the health authorities) and whether to reveal confidential patient data in front of third parties. In Spain, requirements for confidentiality are addressed for specific purposes throughout many different acts, decrees and statutes (for instance, protection of genetic data in one act; organ or gamete donors' anonymity in other one); this fact, along with the lack of specific theoretical training about confidentiality could also explain why less than 20% of the respondents had any information on the legal and ethical consequences of noncompliance, especially regarding prison sentences (Iraburu et al. 2012), despite the increase in sanctions on the part of the legal courts. This confusion was also seen in responses to the scenario regarding the participation of students in the CH of the patient, given that a specific protocol regarding residents and students (Ministerio de Sanidad, Servicios Sociales e Igualdad 2017) details the need for an express consent for access to patient data; failing this consent, separating of clinical data from personal data must occur (Kayaalp 2018). The problem may be that the protocol has been only recently

established (2017) by health centers and CMUs, allowing inappropriate practices to persist, especially among the residents who are more concerned about the clinical aspects of their training.

However, one positive aspect that was noted in this study but not in a prior similar study by Bernice Elger (Elger 2009) was that the professionals underlined the importance of maintaining confidentiality in more than just their workplace, which, in practice, should signify a lesser dissemination of data at, for instance, family gatherings or meetings with friends. People generally accept as a breach of confidentiality any access to an electronic medical record (EMR) of persons who are not their patients, an intentional act that accounts for up to half of the offences that are committed in the handling of computerized data (Neame 2014). The respondents also accepted as a breach of confidentiality the lack of safekeeping of CH by leaving such data in places that can be easily accessed by any person. It is worth comparing the discrepancies in clinical practice since these types of incidents were described in this hospital in a prior study, i.e., some CH were lost and appeared afterwards in a changing room or in a lecture room (Beltran-Aroca et al. 2016).

**Behavior and attitudes affecting confidentiality**

It is expressly stipulated in Law 41/2002 that patients have a right to the confidentiality of their health data, but the doctors attending are permitted to access the current health data for medical purposes (Caine and Tierney 2015; Jefatura del Estado 2002; Page and Mitchell 2006). Although most of the respondents had agreed with this in previous questions, when analyzing how they put these concepts into practice, only 38.5% of participants would directly refuse to give patient information to another colleague, a lower percentage than those reported by Marga Iraburu and colleagues (Iraburu et al. 2006; Iraburu et al. 2012). As for places in which it was most customary to exchange information with other colleagues who are not professionally involved with the patient, they mentioned offices, clinical sessions or, to a lesser extent, communal areas. Unfortunately, discussions that include details and information on patients are frequent in the latter areas (Brann and Mattson 2004; Hodgson et al. 2013), such as lifts (Ubel et al. 1995; Vigod et al. 2003), the cafeteria (Grady et al. 1991), corridors (Iraburu et al. 2006), waiting rooms (Dapaah and Senah 2016), on the stairs, in changing rooms, and so on. However, in their everyday practice, it is likely that doctors did not pay attention to the place where information is given, and this practice was noted in a previous work carried out at the same center (Beltran-Aroca et al. 2016). In this respect, despite the fact

that in the present study 98.5% of participants understood the theoretical premise in the first question that this type of behavior was a violation of confidentiality, 24% of respondents engaged in this behavior outside the hospital. By contrast, only 20% of the individuals maintained that they did not give information outside the hospital. Those respondents were mostly the area consultants, and the data correlated with doctors being older (≥51 yrs.) and with more years in practice (29-45 yrs.) compared to the younger group.

Safeguarding the confidentiality of information therefore depends on sensitivity, professionalism and respect during the medical attention that is given to the patient (Peguero et al. 2015; Shahriari et al. 2012). It is obvious that clinical practice entails the handling, transmission, and management of a large amount of identifying medical data, but there are no unanimous criteria establishing a threshold to distinguish between the disclosure of information that is considered acceptable and that is not (Zhang et al. 2015). Thus, gestures like not closing doors, which reduces a significant level of verbal auditive discrimination (Clamp et al. 2011), speaking in front of third persons (those accompanying the other patients in the hospital rooms), or in the surgery (in front of other patients), were considered to be frequent occurrences in the previous study that was conducted in the hospital (Beltran-Aroca et al. 2016). Several studies have suggested that these are not usually intentional actions (Dapaah and Senah 2016; Elger 2009) and probably are committed not only out of carelessness but also due to learned habits and customs, and unlike in the previous work (Beltran-Aroca et al. 2016), according to the participants in this study, these practices to maintain confidentiality were mostly respected, especially by the area consultants, the older groups, and those with more years of practice. Although doctors are aware of these regulations, previous results indicated that they did not always put them into practice.

Another of the most frequent behaviors that was analyzed was the use of the telephone for exchanging clinical information. Its use has evolved from requesting a surgery appointment, to telemedicine, to obtaining the results of complementary tests. In the latter scenario, the problem lies in authenticating the identification of the individual making the call (Gupta 2013), and this issue becomes even more difficult in determining whether relatives and other persons close to the patient really have obtained the patient's consent to access that information (McKinstry et al. 2009). In this sense, a high percentage (67%) of the doctors answered that they did not directly supply any information by telephone.

This behavior on one hand would prevent any type of legal problem or interference in their already excessive daily workload but on the other would hamper their attention to certain patients who for reasons of distance or disablement could use the telephone to practically and rapidly find out the results of their tests (Sokol and Car 2006).

**Opinion of the doctors on their work center**

The right to confidentiality would seem to be a simple concept when approaching the needs of patients on a one to one basis (doctor-patient). However, it becomes a more complex process with the intervention of health teams (Dodek and Dodek 1997), or the participation of persons linked to the patient for family or *de facto* reasons. With a certain frequency, the clinical information and highly relevant news that is related to the patient's health are conveyed in open spaces or places, such as waiting rooms or corridors in the hospitalization areas (Beltran-Aroca et al. 2016; Scott et al. 2007), which does not support a climate of confidence and intimacy (Mira et al. 2017); this practice was noted as a risk factor in the preservation of confidential data (Hodgson et al. 2013). Although 2.5% of the participants in this current study declared that they had never witnessed these situations in the hospital, a fact possibly related to their status as professionals in the so-called "Central Services" (radiology, microbiology, clinical analyses, etc.) sector, the rest noted that this practice was essentially due to the lack of any specific private spaces to share such information and to a lesser extent to the little time available to them. The hospital staff have constantly mentioned that due to their excessive workload and the shortcomings in infrastructure, the institutions do not always favor and protect the patients' right to intimacy and confidentiality (Peguero et al. 2015), and that is why the respondents underlined that the designation of private spaces as a third measure would be the most important one to improve matters of confidentiality. This is the case of the Emergency (Mlinek and Pierce 1997; Viccellio et al. 2013) or Intensive Care (Holanda Pena et al. 2015; Santana Cabrera et al. 2007) areas, where factors such as the scant separation of beds by curtains (Llamas-Sanchez et al. 2009; Olsen et al. 2008) or reduced floor space can aggravate the loss of the patient's intimacy (Zhang et al. 2015). Although it is useful for the doctors to modify their behavior to boost confidentiality in these places (Lin et al. 2013), it is a known fact that in the hospital in this study (Beltran-Aroca et al. 2016) an improvement in the systems separating the beds in the Emergency department was perceived as an important solution by 10% of the participants.

Preserving the confidentiality of clinical information not only affects the verbal communication between those intervening in the doctor-patient relationship or between the professionals themselves but also the place where it is stipulated: the CH. Although there is a certain amount of confidence in the protective measures that are offered by the centers (Lehnbom et al. 2014), the access to health information is something that is generally of concern to patients and, as demonstrated in this research, also to doctors, especially with regards to the type of data (Grande et al. 2015). Currently, the EMR has been configured as a tool that could improve the quality of attention that the patient receives (Bernat 2013), since it presents a better accessibility, favors rapid clinical decision-making, and makes communication between doctors easier. However, some doubts have been raised with regards to the protection of its contents (Sher et al. 2017; Wallace 2015) due to its nature, to the large amount of data that are stored (Peek et al. 2014) and, according to what has been reported in previous studies, to negligent behavior regarding the access passwords or the computer screens (Beltran-Aroca et al. 2016; Eikey et al. 2015). Such occurrences explain why constant proposals for improvement are being made (Jayabalan and O'Daniel 2016; Kong and Xiao 2015), and up to 29.5% of the participants in this survey emphasized the importance of the hospital in establishing measures to guarantee the security of the EMR.

It has been said that confidentiality is breached daily (Peguero et al. 2015). On these lines, in accordance with previous work done in the hospital (in that study, during an observation period of 4 years, a breach of confidentiality happened every 62.5 hours) (Beltran-Aroca et al. 2016), over 70% of the doctors who were surveyed were of the opinion that confidentiality breaches frequently occurred. On the other hand, it is worth noting that, in spite of those results, 36% selected their own workplace in the case of where they would choose to receive medical treatment. This fact, despite everything else, could demonstrate that the respondents have a certain degree of confidence in the clinical professionalism of their colleagues, although this preference may also be for the sake of convenience and the sense of security they feel in a place that is well-known to them. In addition, another explanation could be that people placed therapeutic success above the value of confidentiality. However, it should not be forgotten that, in the questionnaire, the type of illness was not specified, and reference to the so-called “stigmatizing” diseases (i.e. HIV, alcohol related diseases) could be a determinant in the option to choose the center to be treated by the doctors.

On the same line as previous works (Peguero et al. 2015; Roberts et al. 2008; Tahim et al. 2012), the doctors postulated that adequate training in the legal and ethical aspects of clinical practice would be one of the most important proposals for promoting and preventing situations that can endanger confidentiality (35.5%). In the health community, continuous training has permitted the development of a greater capacity to tackle ethical dilemmas and institute professional values (Poorchangizi et al. 2017). It should be noted that the survey respondents scored higher in the block relating to the theoretical knowledge of confidentiality compared to the block on behaviors, but this discrepancy did not correlate with a better implementation of behaviors to help to maintain confidentiality or prevent incidents. These findings were in contrast with similar works (Iraburu et al. 2006) and the prior observational study that was made in the same hospital (Beltran-Aroca et al. 2016) that showed that, over and above the residents, the doctors aged between 40 and 50 (48.9%) were those who most often violated confidentiality, and the questionnaires reflected that the scores for practical predisposition improved as the professionals' age and years in practice increased. Sturman and Saiepour showed that a group of students did not consider confidentiality among the different ethical problems arising in clinical practice (Sturman and Saiepour 2014), which could partly explain the behavior followed by the residents and younger doctors (≤30 yrs.) with a shorter professional experience (1-3 yrs.), in spite of their receiving a more recent and up-to-date theoretical training. A possible solution would be to increase continuous theoretical training based on the analysis of clinical cases in which ethical problems arising in clinical practice are posed, and another solution could be to directly expose students to situations in which the intimacy and confidentiality of the patient are questioned.

### Limitations

Sample size was representative with a response rate of over 15% of the population; however, we had a very specific questionnaire items analysis since they were based on a previous work at the same center. For this reason, although the right to confidentiality is a general concern in medical practice, the results obtained in this study cannot be extrapolated to other hospitals.

Another significant aspect is that the questionnaire used was not validated, although a panel of experts´ review and a pilot survey were carried out prior to administration of the final version.

## CONCLUSIONS

This work reveals habitual violations of patient confidentiality in the reference hospital (74%).

The respondents did not score highly on the block of medical knowledge on the regulatory aspects that are related to confidential patient data (6.8 out of 10). It is of special concern that 58.5% of the doctors consider that they can reveal such confidential patient data in notifiable diseases, 61% did not know that imprisonment was among the possible sanctions for breaching confidentiality, and a little more than half (54.5%-59%) knew about the regulation in force, but only 1 out of 5 have sufficient knowledge about the aforementioned laws and Code of Deontology (18.5- 25.5%).

The block on attitudes and behaviors in situations in medical practice that are related to confidentiality obtained a slightly lower score than that of knowledge (6.65 out of 10), with significant differences between the area consultants and the residents, between extreme age groups (≤ 30 yrs. *vs.* ≥51 yrs.), and between years in practice. The youngest doctors with fewer years of experience tended to share more of these unacceptable behaviors. The most worrisome behaviors were those of the 80% of participants who admitted discussing issues regarding their patients with other colleagues who are not in their team, and 61.5% of participants would give information to one of the medical staff who took an interest in a patient but with whom that person did not have a medical relationship.

Finally, in reference to possible problems and solutions, the respondents were of the opinion that the training of doctors in aspects of healthcare law and ethics (35.5%) was the most important measure to be adopted by the hospital for the sake of confidentiality. Although medical education should begin at the undergraduate level, proposals such as continuing education courses and mentoring programs for younger physicians would benefit health professionals. In addition, implementing these measures would be very beneficial for respecting the autonomy and rights that are inherent to the patient and would help to prevent situations in which confidentiality is placed at risk.

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## FIGURES

Figure 1. Place where information on patients is exchanged with colleagues who are not treating them, in terms of the doctor's age. *$p<0.05$ vs. $\leq 30$ yrs.

Figure 2. Place where information on patients is exchanged with colleagues who are not treating them, in terms of the professional's years of practice. *p<0.05 vs. rest of the groups.

Figure 3. Place where information on patients is exchanged with colleagues who are not treating them, in terms of the type of professional. p<0.05 between both type of professionals in all locations.

**TABLES**



Table 1. General characteristics of the professionals surveyed

| N=200 | n | % |
|---|---|---|
| *Sex* | | |
| Men | 113 | 56.5 |
| Women | 87 | 43.5 |
| *Age* | | |
| ≤30 yrs[a] | 70 | 35.0 |
| 31-50 yrs. | 72 | 36.0 |
| ≥51 yrs. | 58 | 29.0 |
| *Professional* | | |
| 1-3 yrs. | 58 | 29. |
| 4-9 yrs. | 43 | 21. |
| 10-28 yrs. | 54 | 27. |
| 29-45 yrs. | 45 | 22. |
| *Type of CMU*[b] | | |
| Medical | 133 | 66. |
| Surgical | 15 | 7.5 |
| Medical- | 45 | 22. |
| Others | 7 | 3.5 |

[a]Years
[b]Clinical Management Unit

Table 2. Scores of behavior block

| | | **Mean ± DS** | **p*** |
|---|---|---|---|
| **Sex** | Woman | 6.65 ± 1.91 | NS[c] |
| | Man | 6.65 ± 1.71 | |

| | | | |
|---|---|---|---|
| **Age (yrs.[d])** | ≤30 | 6.01 ± 2.03 | |
| | 31-50 | 6.82 ± 1.65 | <0.001 |
| | ≥51 | 7.22 ± 1.42 | |
| **Yrs. in practice** | 1-3 | 5.92 ± 2.07 | |
| | 4-9 | 6.59 ± 1.68 | 0.001 |
| | 10-28 | 7.10 ± 1.64 | |
| | 29-45 | 7.11 ± 1.39 | |
| **Type of** | Consultant | 7.02 ± 1.55 | <0.001 |
| | Residents | 6.05 ± 2.02 | |

*Statistical significance $p<0.05$. ANOVA test.
[c]Not significant
[d]Years