Objective: to analyze the relationship between knowledge and the adequacy of nursing annotations and their determinants. Method: An exploratory, descriptive and quantitative approach, carried out in the Medical Clinic and in the Adult Intensive Care Unit of a Brazilian university hospital. A total of 114 professionals and 41 medical records were included. Results: The professionals had a high mean score of knowledge and a low mean score of adequacy and there was no correlation between them ($r_s = -0.122; p > 0.05$). The knowledge score was higher for professionals graduated in Nursing. The mean score of adequacy was higher for the professional category nurse if packed in Medical Clinic and with the professional that was dissatisfied with the training. Conclusion: there is no relationship between the professional's knowledge about nursing notes and the adequacy of the notes, which leads to serious ethical, legal and patient safety issues.

Descriptors: Medical record; Continuing education; Legislation; Nursing team; Patient safety.

INTRODUCTION

Annotation or nursing record consists of the transcriptions made by Nursing professional in the patient's chart in an orderly and systematic way of the assistance provided by the nursing team to the patient during the period in which he or she is under their care. In this sense, registration is seen as a fundamental means of communication for health teams, since in addition to expressing the actions carried out, it allows continuity of care and legitimates the professional's work through support in ethics and legislation.

The registration is the representation of a fact or an act, relative to the patient's conditions, provided they are expressed in an organized, clear, objective and concise manner, being considered a way of proving and guaranteeing the effectiveness of care and quality of the assistance provided. For the correct accomplishment of nursing notes, it is necessary to know what to note, when, where, how, why, and who should be annotated. The record must be written legibly and must have no erasures; must include the identification of the author, the registration number in the Regional Nursing Council and the stamp. Must be duly identified with patient data, plus date and time, and written pen as established by institution.

Under the legislation, art. 1 of Resolution no. 429 of May 30, 2012, of the Federal Nursing Council says that "it is the responsibility and duty of nursing professionals to record in the patient's medical records and in other documents of the area, the information inherent in the care process". Article 4 of Deliberation no. 135 of October 10, 2000, of the Regional Council of Nursing of the state of Minas Gerais, states that "the registry must contain subsidies to allow the continuity of nursing care planning". Decree of no. 94,406 of June 8, 1987 and Law no. 7,498 of June 25, 1986, which regulate the exercise of nursing, it is incumbent upon the nursing staff, the responsibility for recording in the patient's chart the activities of nursing care.

Even though Brazilian legislation indicates that nursing records are mandatory and important in order to legally support professionals, even those who are aware still carry out the annotations without considering their legal value and the quality of their notes, not considering them as a tool for work, devaluing its functionality. It is noteworthy that the Brazilian literature has an extensive number of publications that evaluate and analyze nursing notes in patients' charts, in which the common denominator is the absence of complete and consistent records. In this context, another topic that is much discussed concerns the professional's perception of their notes, in this sense, professionals recognize the importance of noting all the data, but often do not make the necessary notes. This situation can generate ethical, legal problems and even risk the patient's safety by not continuing care.

Thus, this research aimed to analyze the relationship between knowledge and adequacy of nursing notes. And as specific objectives: to evaluate some determinants of this relation as degree of complexity of the unit, time of performance of the professional, professional category of the performer, professional training and if participated in continuing education.
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METHODS
An exploratory, descriptive, analytic and quantitative approach, at the Hospital de Clínicas de Uberlândia, a university hospital in the state of Minas Gerais, Brazil. Two hospitalization units were evaluated: the Medical Clinic (MC) and the Intensive Care Unit for Adults (ICUA). The research was submitted to the Human Research Ethics Committee of the Federal University of Uberlândia, approved under opinion number 1823972, and followed Resolution 466 of 2012 of the National Health Council.

Nursing professionals with active professional ties in the hospital were included in the study period, who accepted to participate in the study and signed the Free and Informed Consent Term. The charts consulted were those of patients who received care from a professional included in the study, were older than 18 years and patients whose legal representatives authorized access to the medical record, both through the signature of the term. All the professionals of the units were invited to participate in the study. The data collection was carried out from January to June 2017.

For the evaluation of the professionals' level of knowledge, the sample consisted of 114 participants. Of these, 45 were professionals of the Medical Clinic and 69 professionals of the ICUA. As for the professional category, for which they were hired at the institution, 22 nursing assistants, 74 nursing technicians and 18 nurses were included.

In order to evaluate the profile of the professionals, data were collected on: age, sex, time of professional work, professional category for which was hired in the institution, if you have a degree in Nursing, if you had any type of training on nursing notes, whether or not satisfied with the training they received and how satisfied they were with the training (assessed by a Likert numerical scale from 0 to 10).

In order to evaluate whether the professionals' knowledge contemplated the legal aspects and the main characteristics for the accomplishment of a nursing note, a questionnaire with 24 questions with dichotomous answers was used, true or false, adapted from Antunes et al. The questions evaluated mandatory criteria and techniques covered in a short course offered by the hospital and given by a representative of the Regional Nursing Council of the State of Minas Gerais. Details of the course can be found in Mendes-Rodrigues et al. In this questionnaire the participants were identified with a code so that their identity was not known. The codes were randomly distributed at the time of returning the questionnaire. This was necessary so that the data about their knowledge about the nursing notes were paired and compared with the scores of appropriateness of the notes that they made.

An adapted form of Antunes et al. was used to assess the adequacy of nursing notes. The same was used to record the appropriate characteristics or not of the notes made by the professional in the patient’s chart. The instrument is a checklist composed of 21 evaluation items, all of which are dichotomous (yes - appropriate or not - not suitable). The data collection in the nursing annotations occurred in notes that had already been made by
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the professional before answering the questionnaire of knowledge assessment, however, in some cases in the ICU, the collection was done in notes made after the response to the evaluation questionnaire because there was a delay in the questionnaire response and it was not possible to obtain authorization from patients who had already left hospital or died.

One hundred and four nursing notes made by 99 of the 114 professionals participating in the study were evaluated for the adequacy of nursing notes, totaling 349 annotations from 41 patients' charts, from 1 to 17 annotations per patient record. Only the nursing notes from the "Nursing Notes" form standardized at the institution were evaluated, and all the annotations were considered in a period of 6 hours for the morning and afternoon shifts or 12 hours for the night shift. In this form, no nursing evolutions are recorded, and the annotation of care provided by the nursing team during hospitalization is restricted. For each employee, the mean of the nursing scores adequacy scores was calculated, and this mean was considered the mean adequacy score.

The data were tabulated in spreadsheets, processed and analyzed using the IBM SPSS software (version 20.0 for Windows). The level of significance was set at 5% for all analyzes. The data mostly did not follow Gaussian distribution, being tested with the Kolmogorov Smirnov Lilliefors test. Quantitative data were described with mean, median, standard error, minimum and maximum; and qualitative data with absolute and relative frequencies.

Table 1: Profile of nursing professionals evaluated regarding the relation of knowledge and adequacy of nursing notes in two units of a Brazilian university hospital. 2017.

Evaluation of the nursing notes

In order to evaluate the relationship between knowledge scores and mean adequacy score with quantitative variables, a Spearman correlation analysis was performed and the significance of the correlation was tested with Student's t-test. The values of the knowledge scores and the adequacy of the records were compared between the variables of the socio-professional-demographic profile with the Mann-Whitney test or Kruskal-Wallis test and for multiple comparisons the Dunn test. The relationship between the mean adequacy score (dependent variable) and the knowledge score (independent variable) was tested with simple linear regression and its significance was tested with F statistic from ANOVA.

RESULTS

In the sample evaluated professionals predominated in the ICUA (60.53%), female (78.95%). The majority of the participants were nursing technicians (64.91%), almost half (47.37%) had undergraduate Nursing, most of them self-referenced participation in training with the nursing annotation theme (73.68%) and was satisfied with the training (84.71%). The professionals had a median age of 36 years, median time of work of 11 years, satisfaction with training corresponded to median 8 (scale from 0 to 10), the mean knowledge score on annotations was median 87.50% (mean: 86.51%) and the median score adequacy score was 16 points (mean: 15.55 points) (Table 1).
When the relationship between the quantitative variables was evaluated, the professionals’ time of work was directly correlated with their age ($r_s = 0.733$, $p < 0.01$); and the other variables were not correlated. The

### Table 2: Spearman correlation between the quantitative variables related to knowledge and performance on nursing notes in two units of a Brazilian university hospital, 2017.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Age</th>
<th>Time of work</th>
<th>Satisfaction scale</th>
<th>Score knowledge</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time of work</td>
<td>0.733 **</td>
<td>-0.019 ns</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Satisfaction scale</td>
<td>-0.041 ns</td>
<td>-0.019 ns</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Score knowledge</td>
<td>-0.106 ns</td>
<td>0.008 ns</td>
<td>-0.122 ns</td>
<td></td>
</tr>
<tr>
<td>Media score adequacy</td>
<td>0.108 ns</td>
<td>-0.049 ns</td>
<td>0.0156 ns</td>
<td>0.105 ns</td>
</tr>
</tbody>
</table>

Caption: **: $p<0.01$; ns: $p>0.05$. 
When comparing the medians between the strata of the variables of the profile, we observed that the median of the percentage of correct answers for the Medical Clinic sector was not different from that obtained in the ICUA ($Z = -0.484$, $p = 0.628$), as we did not observe difference for sex ($Z = -0.761$, $p = 0.447$), for the professional category ($X^2 = 3.246$, $p = 0.197$), and for the participation being or not satisfied with the training on the subject ($Z = -0.771$, $p = 0.441$). When comparing whether the participant has undergraduate or not, those who are graduated in Nursing have the highest knowledge score (median 91.67, mean 89.20, standard error = 0.88, variation = 62.50-100, $n = 54$) than those without undergraduate nursing (median = 84.10, standard error = 1.34, variation = 45.83-100, $n = 60$) ($Z = -3.113$, $p = 0.002$). In the Medical Clinic, the nursing score adequacy score was higher (median = 16.75, $n = 45$, mean ± standard error = 16.58 ± 0.27, variation = 13.50 - 20.0) when compared with the UTIA (median = 15.25, $n = 69$; mean ± standard error = 14.89 ± 0.40, range = 5.00 to 21.0) ($Z = -3.021$; $p = 0.003$). The nurses have the most adequate records (median = 18.62, $n = 18$, mean ± standard error = 18.29 ± 0.69, variation = 13.25 to 21.00) when compared to the values obtained by technicians (median = 15.25, $n = 74$, mean ± standard error = 15.32 ± 0.32, range = 5 to 20) and nursing assistants (median = 16.00, $n = 22$, mean ± standard error = 15.02 ± 0.60, range = 5.33 to 18.50) ($X^2 = 12.590$, $p = 0.002$). The comparison between auxiliaries and nursing technicians showed no differences in the mean adequacy score ($p > 0.05$). Participants who self-reported dissatisfaction with training received a median of the highest mean adequacy score (median 17.62, $n = 13$, mean ± standard error = 17.19 ± 0.77, variation = 10.75 to 20.0) than those who self-reported satisfaction (median = 15.25, $n = 72$, mean ± standard error = 15.23 ± 0.33, range = 5 to 20.0) ($Z = -2.686$; $p = 0.007$). There were no differences for the variables gender ($Z = -0.048$, $p = 0.962$), graduation in Nursing ($Z = -1.904$, $p = 0.057$), and participation in training on the subject ($Z = -0.189$; $p = 0.850$). There was no significant linear relationship between the knowledge score and the nursing score adequacy score ($p = 0.5227$; Figure 1), showing a disconnect between theory and care practice. This lack of relationship shows that there is no relationship between knowledge about nursing notes and the application of this knowledge (evaluated by the mean adequacy score) in the execution of nursing notes.

The highest percentage of errors identified in the questionnaire assessing knowledge about nursing annotations was in the issues related to ink registration and color standardization according to schedule (44.74%), followed by date report (39.47%), raw data recording without analysis, interpretation or evolution of the data (35.96%), and the use of terms with a connotation of value instead of the measurement (35.09%).
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Figure 1: Linear regression model between the knowledge score (x = independent variable) and the mean adequacy score (y = dependent variable) for nursing records in two units of a Brazilian university hospital, 2017. Caption: y = linear regression model y as a function of x, $R^2$ = coefficient of determination, $F$: ANOVA F statistic, d.f. = degrees of freedom, $p$ = probability.

$$y = 0.0217x + 13.684$$

$$R^2 = 0.0054$$

Already the questions concerning the identification of the professional category at the end of each annotation performed, identification of the time at the beginning of the annotation, correction of spelling errors by means of the erasure, accomplishment of the registration following some characteristics, such as clarity, legibility, organization, objectivity and concision presented the highest percentage of correct answers (both 99.12%) (Table 3).

Table 3: Frequency of correct answers and errors in the knowledge test about the adequacy in nursing notes in two units of a Brazilian university hospital. 2017.

<table>
<thead>
<tr>
<th>Question</th>
<th>Error</th>
<th></th>
<th>Right</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
<td></td>
</tr>
<tr>
<td>Mandatory identification of the professional</td>
<td>5</td>
<td>4.39</td>
<td>109</td>
<td>95.61</td>
</tr>
<tr>
<td>Mandatory identification of the professional category</td>
<td>1</td>
<td>0.88</td>
<td>113</td>
<td>99.12</td>
</tr>
<tr>
<td>Presence stamp on annotation</td>
<td>8</td>
<td>7.02</td>
<td>106</td>
<td>92.98</td>
</tr>
<tr>
<td>Presence of registration number</td>
<td>7</td>
<td>6.14</td>
<td>107</td>
<td>93.86</td>
</tr>
<tr>
<td>Presence of the professional's signature</td>
<td>24</td>
<td>21.05</td>
<td>90</td>
<td>78.95</td>
</tr>
<tr>
<td>Report Date</td>
<td>45</td>
<td>39.47</td>
<td>69</td>
<td>60.53</td>
</tr>
<tr>
<td>Record time for each note</td>
<td>1</td>
<td>0.88</td>
<td>113</td>
<td>99.12</td>
</tr>
<tr>
<td>Readability</td>
<td>2</td>
<td>1.75</td>
<td>112</td>
<td>98.25</td>
</tr>
</tbody>
</table>
### DISCUSSION

The patient's chart is legally recognized as a document in which all the information regarding the period of hospitalization must be recorded, and it is fundamental to understand the importance and size of noting properly all the activities performed.

Nursing notes represent approximately 50% of the information pertinent to the care present in the medical records, being daily activity in the nursing professional practice. These constitute an evaluation tool to measure the quality of service provided by the nursing team.

The median of correct answers for knowledge test conducted in ICUA sector did not differ in Medical Clinic. We believed that the complexity of the sector would be a determining factor in the professionals' knowledge and that, therefore, the ICUA professionals would present a better knowledge than those of the Medical Clinic, which did not occur. Further studies are needed to assess in depth the effect of the degree of assistance complexity on the level of knowledge of professionals in each unit. One factor that may explain this is the possible standardization of the level of knowledge among the professionals of the two units through self-referenced participation in training on the subject, since the units present good indicators of participation in continuing education courses. In the evaluation of a hospital training cycle in which Nursing Notes was addressed, the Medical Clinic reached an mean of 37.50 hours of training per professional and the UTIA reached 28.92 hours per professional, and this indicator
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oscillated between the hospital unit from 14.93 to 48.25 hours per professional.10

A study that compares the knowledge of nursing professionals regarding the knowledge acquired by different professional categories in patient safety courses in the same institution showed nurses obtaining higher scores than the other categories,13 but when the subject matter was related to hand hygiene there were no differences between the categories regarding acquired knowledge.14 As pointed out by Antunes et al.,9 several studies have detected a low representation of nurses, which in some institutions may even be non-existent,9 a fact that hinders a better evaluation of the records of these professionals.

When comparing the knowledge of the participants, it was verified that those who had graduation in Nursing had scores of knowledge greater than those who did not have. Thus, higher formal education seems to have been the only relevant factor for the increase of knowledge, since the baccalaureate must work the skills and abilities of the nurse.15 It is important to point out that there is a trend towards a higher academic level than that required for the position of the professional. This can be seen both at national level,16 and at local institutions. A study in Porto Alegre Clinical Hospital found that 41% of the studied nursing professionals attended or had graduation, highlighting qualifications required above the position for which the professional was hired.17 Although there are studies that demonstrate that in up to 100% of the records made by nurses regarding the collection of tracheal secretion there are short records, without details and without the description of post-collection results.18 These results and the low frequency of registrations performed by Nurses, raises the need for studies that understand this behavior.

In the Medical Clinic sector the mean adequacy score for nursing notes was higher than that presented in the ICUA. This result is different from studies performed at the same institution that showed a better appropriateness of ICU annotations.9 This difference in results may have been caused by the recent implementation of the Nursing Care Systematization in the sector, which may have negatively influenced the quality of the participants' records, since with the prescription and nursing care check a considerable part of the annotations are no longer made, although this hypothesis still needs to be tested. The evaluation of the systematization process of nursing care in two units observed that approximately 18 and 29% of the records are unsatisfactory,19 demonstrating that the systematization of nursing care is not always a guarantee of good records. The fact that the patient of intensive care units presented greater complexity is not a factor that leads to better nursing notes since several studies have identified low quality of annotations in this environment.20-21

The process of systematizing nursing care enables the elaboration of individual care through the construction of nursing prescription, being an instrument that tends to make possible the improvement of records for the care provided to the patient.22 This trend does not seem to have occurred in the unit evaluated, since the adequacy was lower than in the
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Medical Clinic, where nursing care systematization was not implemented.

When analyzing the nursing notes made by the different professional categories, it is verified that those performed by nurses are more adequate than those performed by nursing technicians and auxiliaries. This result is similar to that observed in another study, aiming to analyze the nursing notes after a training activity on the subject. The fact that nurses are the professionals who make the least annotation may be related to the greater adequacy of their annotations, since in noting more punctual aspects may result in more time for the activity and be liable to fewer errors, since the level of knowledge is equal between the categories, although the data do not allow to test this hypothesis.

Participants who showed dissatisfaction with the training presented greater adequacy of nursing notes than those who demonstrated satisfaction. This was contrary to what was expected, since at first it was thought that the participants who felt satisfied would make more appropriate notes. This dissatisfaction referred to by the participants may be related to a high knowledge of the theme or inadequacy of the methodology adopted in continuing education.

The study found that the participants present a high mean score of knowledge about nursing notes, demonstrating that they know how such notes should be made. On the other hand, it found a low mean score of adequacy of nursing notes in professionals with high knowledge, demonstrating that they do not make the notes correctly. There is an absence of relationship between knowledge and appropriateness of notes. At first it was expected that the professionals with more knowledge would make more appropriate notes, which did not occur. A study addressing the perceptions of the nursing team about their records emphasizes that it recognizes the importance of the notes for the quality of care, however, in practice this recognition is not observed.

In the nursing annotations knowledge test, applied to the participating professionals, the highest percentage of errors was observed in the issue related to the accomplishment of the ink registration and in the color standardized by the institution. Regarding this, it is important to emphasize that the color of the paint to be used is an institutional standardization and not a rule of records, and a differentiation can be observed from one institution to another, as observed in other studies.

Another aspect that draws attention is the fact that nursing professionals do not worry about the ethical and legal principles of the notes. Sometimes professionals forget that for a document to be considered a legal instrument it must be signed and dated, otherwise it may not be accepted as evidence or be indicative of poor quality of care. For the question regarding the identification of the date in the registry, a high percentage of errors was observed, since it demonstrates the lack of concern pointed out by the studies mentioned above. There are records of 12-17% of nursing notes with no date and time record, and that approximately 98% of the notes do not contain the responses to patient care.
In addition, recording analyzed data instead of raw data was another issue with a high percentage of errors. This fact can be a reflection of the difficulty of the professionals in differentiating annotation of nursing evolution. It is also believed that this characteristic has a relationship with the formation of professionals above that required for the position held.

Another item that had a high percentage of errors in the questionnaires evaluated was the use of terms with a connotation of value rather than measurement, which should not be used according to the Federal Nursing Council. A study carried out in an intensive care unit reinforces the importance of correctly and accurately specifying the drained and eliminated volumes for the performance and evaluation of the water balance and also for the correlation with the results of the exams, highlighting how important it is the nursing annotation for the continuity of health care.

There is a disregard of the professional with the recipient of documents and/or records, using ambiguous terms that seriously compromise information and pose legal risks to all involved. In a study evaluating nursing notes, it was observed that the content of the records is deficient, does not portray the reality of the patient nor does the nursing care provided do not contribute to the development of the nursing process of these patients.

**CONCLUSION**

The study allowed to conclude that there is no relationship between the knowledge of the professional about nursing notes and the adequacy of the annotations he makes in the patient’s chart, that the nursing professionals present a high mean score of knowledge about nursing notes and a low score mean of adequacy of such annotations. It was also concluded that nursing professionals, regardless of their position, present better scores of knowledge than those who are not graduates, nurses make more adequate records than technicians and nursing assistants and in the Medical Clinic the records were better than in the Intensive Care Unit.

These results demonstrate the need to know the reasons why professionals do not make the notes as they should, despite knowing how to do them ignoring ethical, legal and patient safety issues.

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Evaluation of the nursing notes
Evaluation of the nursing notes

Collaborations

RCS: Substantial contributions in the design of the work; data collection and interpretation; writing of the article or in its critical review; and the final version to be published. AVA: Substantial contributions in the conception of work; interpretation of data; writing of the article or in its critical review; and the final version to be published. CMR: Substantial contributions to the design of work; analysis and interpretation of data; writing of the article or in its critical review; and the final version to be published. NMJ: Substantial contributions to data interpretation; writing of the article or in its critical review; and in the final version to be published.

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CONFLICTS OF INTEREST
The authors declare that no have conflicts of interest

AVAILABILITY OF DATA
Available upon request to the authors

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CORRESPONDENCE
Clesnan Mendes-Rodrigues
Universidade Federal de Uberlândia, Campus Umuarama, Enfermagem, Bloco 2U - Sala 11, Av. Pará, 1720 - Bairro Umuarama, Uberlândia - MG - Brazil - CEP 38400-902
Telephone: 55 (34) 3225-8603
E-mail: clesnan@hotmail.com