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## **NURSES' EMPATHY IN AN EMERGENCY HOSPITAL SERVICE**

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### **ABSTRACT**

**Objective:** to analyze the empathy of nursing professionals who work in an urgency and emergency hospital service.

**Method:** a cross-sectional study with 230 nursing professionals working in a public hospital in Maceió (Alagoas/ Brazil). Data collected by sociodemographic questionnaire and Empathy Inventory between 2014 and 2015. Descriptive statistics of the data, analysis of variance and Cronbach's alpha of significance 0.05.

**Results:** out of the 230 professionals, 59 were nurses and 171 mid-level nursing professionals, with a mean age of 42.3 years old, 205 were women, 120 were married, 175 had children and 108 had a college education. Participants had higher levels of affective sensitivity (82.9%) and perspective (73.0%), followed by altruism (64.7%) and interpersonal flexibility (59.7%). In general, there was a statistically significant difference between the nursing professionals in relation to empathy, and the nurse was more empathic ( $p$  value=0.039) than the other professionals.

**Conclusion:** among the four factors that make up the empathy ability, the greater ability to take perspective, to raise awareness of other people's situations, to accept ideas that are foreign to theirs, and to sacrifice themselves for the benefit of others, have stood out among the nursing professionals in the emergency service. In nursing, empathy is generally associated with the professional category.

**DESCRIPTORS:** Nursing service, hospital. Emergency nursing. Nursing care. Empathy. Emergency medical services.

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# EMPATIA DOS PROFISSIONAIS DE ENFERMAGEM DE UM SERVIÇO HOSPITALAR DE EMERGÊNCIA

## RESUMO

**Objetivo:** analisar a empatia dos profissionais de enfermagem que atuam em um serviço hospitalar de urgência e emergência.

**Método:** estudo transversal com 230 profissionais da enfermagem atuantes em um hospital público de Maceió (Alagoas/Brazil). Dados coletados por questionário sociodemográfico e Inventário de Empatia entre 2014 e 2015. Estatística descritiva dos dados, análise de variância e Alfa de Cronbach de significância 0,05.

**Resultados:** dos 230 profissionais, 59 eram enfermeiros e 171 profissionais de enfermagem do nível médio, com idade média de 42,3 anos, 205 mulheres, 120 casados, 175 tinham filhos e 108 possuíam escolaridade de nível superior completo. Os participantes apresentaram maiores índices de sensibilidade afetiva (82,9%) e tomada de perspectiva (73,0%), seguidos de Altruísmo (64,7%) e flexibilidade interpessoal (59,7%). De maneira geral, houve diferença estatisticamente significativa entre os profissionais de enfermagem em relação à empatia, sendo o enfermeiro mais empático ( $p$  valor=0,039) do que os demais profissionais.

**Conclusão:** dentre os quatro fatores que compõem a habilidade de empatia, a maior capacidade de tomada de perspectiva, de se sensibilizar com a situação de outras pessoas, do que aceitar ideias alheias às suas e de se sacrificar em benefício do outro, destacaram-se entre os profissionais de enfermagem no serviço de emergência. Na enfermagem, a empatia está associada, de uma maneira geral, à categoria profissional.

**DESCRIPTORIOS:** Serviço hospitalar de enfermagem. Enfermagem em emergência. Cuidados de enfermagem. Empatia. Serviços médicos de emergência.

# LA EMPATIA DE LOS PROFESIONALES DE ENFERMERÍA DE UN SERVICIO DE URGENCIA EN HOSPITAL

## RESUMEN

**Objetivo:** analizar la empatía de los profesionales de enfermería que actúan en un servicio de urgencia y emergencia en hospital.

**Método:** estudio transversal con 230 profesionales de la enfermería actuantes en un hospital público de Maceió (Alagoas/Brazil). Datos recogidos por cuestionario sociodemográfico e Inventario de Empatía entre 2014 y 2015. Estadística descriptiva de los datos, análisis de varianza y Alfa de Cronbach de significancia 0,05.

**Resultados:** de los 230 profesionales, 59 eran enfermeros y 171 profesionales de enfermería del nivel medio, con edad media de 42,3 años, 205 mujeres, 120 casados, 175 tenían hijos y 108 poseían escolaridad de nivel superior completo. Los participantes presentaron mayores índices de sensibilidad afectiva (82,9%) y toma de perspectiva (73,0%), seguidos de altruísmo (64,7%) y flexibilidad interpersonal (59,7%). En general, hubo diferencia estadísticamente significativa entre los profesionales de enfermería en relación a la empatía, siendo el enfermero más empático ( $p$  valor=0,039) que los demás profesionales.

**Conclusión:** entre los cuatro factores que componen la habilidad de empatía, la mayor capacidad de toma de perspectiva, de sensibilizarse con la situación de otras personas, que aceptar ideas ajenas a las suyas y de sacrificarse en beneficio del otro, se destacaron entre los profesionales de enfermería en el servicio de emergencia. En la enfermería, la empatía está asociada, de manera general, a la categoría profesional.

**DESCRIPTORIOS:** Servicio de enfermería en hospital. Enfermería de urgencia. Cuidados de enfermería. Empatía. Servicios médicos de urgencia.

## INTRODUCTION

Empathy is an ability of social interaction constituted by affective, cognitive and behavioral components. In the affective component, there is a tendency to experience signs of sympathy and compassion. In the cognitive one there is a conception of the capacity to interpret and to understand the perspective of the other. In the behavioral component, there is the characterization of verbal or non-verbal communication as an explicit form of recognition of the other person's feelings and perspectives.<sup>1</sup>

It is an instrument of light technology that can be used by nurses in the integral attention to the person, and materializes in the attitudes of those who apply it.<sup>2-3</sup> It consists of interpersonal relationships based on respect, reciprocity with the objective of helping, which in the assistance contributes to resolute care, improves self-knowledge, increases self-care capacity, reduces anxiety and stress, and provides balance between environment and individuals.<sup>4-6</sup>

Empathy is a socially learned skill and contributes to the formation of the bond between the user and the nursing professional, who, because of dedication to the well-being of human beings, is also characterized as a profession of help.<sup>3-7</sup>

It is necessary in the urgency and emergency services, which by their nature are very complex and require fast resolution. They are the main gateway to the Brazilian health system, which has led to overcrowding related to the search for users for low complexity care, deficiency in primary care, lack of organization in referral and counter-referral, and own deficit and bureaucratic functioning of some services.<sup>8-9</sup>

Studies on empathy reveal that the nursing professional often finds the work environment with lags favorable to stress, with a tendency to physical and emotional exhaustion.<sup>2</sup> This consequently affects the interpersonal relationship between user-professional. These findings converge with results from another study, which found that more fatigued professionals have less empathy and that higher levels of empathy were associated with lower levels of *burnout*. Thus, it has suggested a reduction in professional burnout, which can help maintain the levels of empathy of high-level emergency professionals, which in turn will ensure a better quality of care.<sup>10</sup>

Another study, which evaluated the relationship between empathy of nursing professionals and well-being, observed that emergency nurses appear to have low levels of empathy, in addition to perceiving in this professional class elevated levels of psychological suffering and low well-being. Empathy and well-being seem to be related, as higher empathy scores were found in nurses with higher well-being. The poor mental health found among emergency nurses is alarming, so it was stressed the need for interventions, given the relationship between well-being and empathy.<sup>11</sup>

There is a shortage of studies involving empathy and emergency service. There is a lack of evaluation in the empathy studies, especially the possibility of their evaluation. Some studies disregard the multidimensionality characteristic recognized by authors, which strengthens the need to propose new ways of studying empathy.<sup>12</sup>

Given the importance of this ability in the practice of nursing professionals, who suffer from the erosion of the emergency and emergency service and the lack of research that evaluates the empathy of nurses and nursing technicians, especially at the national level, this study aims to analyze the empathy of nursing professionals who work in an emergency and emergency hospital service.

## METHOD

A cross-sectional, quantitative approach, carried out in a public hospital specialized in emergency and emergency, located in the city of Maceió, capital of Alagoas (Brazil). The study population comprised 730 nursing professionals. These were distributed at medium level, represented by technicians and nursing assistants; and in professionals of the higher level, nurses, who provided service in the emergency and emergency sectors, with links in the institution by competition or contract.

The sample was calculated considering the population of 730 nursing professionals to detect a minimum prevalence of 23%, with relative error of 20% (maximum allowed statistically) and absolute of 4.6%. The resulting confidence interval was 15.4% at 24.6%. The sample size, calculated by the Epidat version 3.1 program was 224 professionals. After completing the data collection, 230 questionnaires were verified and, in this way, this study was carried out based on these 230 nursing professionals.

The inclusion criteria were: to be a nursing professional of the upper or middle level who provide direct assistance to the user and to have an employment relationship through a public or contract tender. The exclusion criteria were: professionals who work in management sectors, or who do not assist the user directly, and those who were on leave or away from the service during the period of data collection.

The collection occurred between July 2014 and January 2015. An individual approach was taken to the participant in their respective sector during working hours, which favored the professionals' adherence to the research. The collection schedules comprised the morning, afternoon and evening shifts, with the purpose of capturing the professionals who worked in the different periods. In addition, the collection was organized by sectors, covering the areas of the hospital that provide emergency service (red trauma area and clinical red area) and emergency (yellow, green and blue areas).

The moment of the approach consisted in the invitation to the participant to contribute with the research, explanation about the same, signing of the Informed Consent Form, and beginning of the data collection with the fulfillment of the instruments.

Two instruments were applied: a sociodemographic questionnaire elaborated for this research, in order to characterize the participants, composed of questions related to: sex, marital status, educational level, length of service, working hours, one has heard of empathy, and the way in which he used time off; and empathy inventory (IE), an instrument developed and validated in Brazil, which evaluates empathy according to a multidimensional model, composed of a 40 item scale, based on the cognitive, affective and behavioral components of empathy, in 16 situations of social interactions.<sup>13-14</sup>

The responses of each item were numbered from 1 to 5, on a Likert scale, where 1 corresponded to Never, 2 Rarely, 3 Regularly, 4 Almost always and 5 Always, according to the frequency with which events (situations of interactions social), whether experienced or not, applied to respondents. These items were answered according to situations that involved the following factors: 1 - Perspective making (OM) - the content of its 12 items is related to the ability to understand the perspective and feelings of the other person, even in situations involving conflict of opinions and interests; 2 - interpersonal flexibility (IF) - presents ten items that refer to the ability to tolerate behaviors, attitudes and thoughts of others that are very different or frustrating; 3 - altruism (AL) - composed of nine items, reflects the ability to sacrifice one's own interests, for the purpose of benefiting or helping another person. 4 - affective sensitivity (AS) - present in nine items, is expressed by the capacity to feel compassion and interest in the emotional state of the other.<sup>13-14</sup>

The answers tend to be more positive for empathy, the closer they are to numbering 5 (always). However, 17 items are considered reverse, that is, the most empathic response given by the participant in the questionnaire is 1 or 2. In this way, for the purposes of analysis, the alternatives are inverted in the database in order to obtain the final score, for example, the answers 5 (always) and 4 (almost

always) are replaced by the alternatives 1 (never) and 2 (rarely), respectively, or vice versa. Only response 3 (regularly) was maintained. Reverse items were 3,4,5,8,9,13,16,19,20,22,24,26,30,32,35, 38 and 40, located in factors 2 and 3, *i.e.*, FI and AL.<sup>13-14</sup>

Software Microsoft® Excel® version 2016 was used to organize the data and, and then the database Excel was read by Software EPI INFO version 3.5.4 for analysis. In the data treatment, descriptive statistics (absolute and relative frequencies, mean and standard deviation), analysis of variance (ANOVA) and Cronbach's alpha coefficient were used, being considered significant  $p < 0.05$ .

Data analysis considered that the higher the score obtained in the instrument, the greater the tendency to empathic behavior. Two analyzes were separated, one that evaluated the empathy of the participants, called general empathy, and another that analyzed the empathy according to the professional category. The inventory factors in these two analyzes were observed separately and summed (total score).

In addition, the scores obtained on the factors and their sum (total score) of the general empathy quoted above were transformed into the percentage form and compared to the reference value corresponding to the maximum score, which can be obtained by respondent by factor of the inventory and in the total score. To obtain this percentage, we used the simple three rule present in the books of basic mathematics. From this mathematical subject, one can substitute this rule in the formula presented in Figure 1. This calculation sought to verify proportionally the factors that were higher when compared to each other. In this way, those who came closest to 100% indicated a higher tendency to the empathic attitude.

$$\% \text{ Factor} = \frac{p.100\%}{n.5}$$

**Figure 1** - Formula for calculating the percentage.

In this formula, “% Factor” corresponds to the percentage of the score found for the factor analyzed, “p” corresponds to the score found in the factor, “n” refers to the number of items of the factor, and numeral “5” corresponds to the maximum score (always) or more positive for empathy, according to IE.

This study was developed through the evaluation of bioethical references and ethical foundations related to research involving human beings.

## RESULTS

230 nursing professionals participated in the study, where 74.3% were at the secondary level (technicians or nursing assistants) and 25.7% of the superiors (nurses), while 46.9% of the participants had a higher education level in Nursing or in other courses; 50.9% were younger than 42 years; this value was found based on the mean age of the examined group; 89.1% were female and 10.9% male; 52.2% were married and 47.8% were unmarried; 70% declared themselves as non-white and 30% as white; 76.1% had children and 23.9% had no children; the mean number of children was 1.59 and the standard deviation was 1.07 (Table 1).

The variable “what do you do during breaks” revealed that most of the professionals carried out household activities (60.9%), watched television (59.1%), used the computer (43%), studied (28,7%) and other activities. It is justified that the variable presents a total percentage above 100% because the participants perform more than one activity in the moments of absence. 50.9% had another employment relationship; 88.3% have heard of empathy; 62.2% had no working time less than 120 months; 47.2% had a weekly workload of less than 36 hours and 59.6% worked in the emergency

sectors (yellow, green and blue areas) and 40.4% in the emergency (red trauma and clinical areas) sectors (Table 1).

**Table 1** - Personal and professional characteristics of the participants.  
Maceio, AL, Brazil, 2015. (n=230)

<b>Sociodemographic Profile</b>		
<b>Variable</b>	<b>N</b>	<b>%</b>
Age group*		
<42	117	50.9
>42	113	49.1
Sex		
Female	205	89.1
Male	25	10.9
Maximum degree of study		
Higher education degreee	108	46.9
Average	91	39.6
Incomplete higher education	31	13.5
Professional category		
Nursing (medium level)	171	74.3
Nurse (upper level)	59	25.7
Marital status		
Married	120	52.2
Not married	110	47.8
Race/skin color		
Not white	161	70.0
Caucasian	69	30.0
Children		
With children	175	76.1
Without children	55	23.9
Has another employment relationship		
Yes	117	50.9
No	113	49.1
Have you heard of empathy		
Yes	203	88.3
No	27	11.7
Service time less than 120 months		
No	143	62.2
Yes	87	37.8
Weekly hour load <36 hours		
No	121	52.6
Yes	108	47.0
Not informed	1	0.4
Work in the sector		
Urgency	137	59.6
Emergency	93	40.4

\*Mean age=42.3 and standard deviation (SD) = 8.47



## General analysis of empathy

The lowest scores for empathy were identified in the IF factors (score 29.3, 58.6%) and AL (score 28.9, 64.2%), when compared to PM (score 43.4, 72.3%) and AS (score 36.9, 69.3%) (Table 2).

**Table 2** - Empirical scores and their respective percentage in each of the factors.  
Maceio, AL, Brazil, 2015. (n=230)

Empathy Scores			
Empathy Factors	Reference value	Score	%
Perspective taking	60.0	43.4	72.3
Interpersonal flexibility	50.0	29.3	58.6
Altruism	45.0	28.9	64.2
Affective sensitivity	45.0	36.9	82.0
Total score	200.0	138.6	69.3

## Analysis of empathy according to professional category

It revealed that all the empathy factors obtained higher average among nurses, when compared to the mean of the nursing of average level. The value of  $p < 0.05$  discards the hypothesis of equality between the scores and, consequently, indicates a significant difference between the means compared. Thus, the nurses were more altruistic (Factor 3) and empathic (Total) than the mid-level nursing professionals (Table 3).

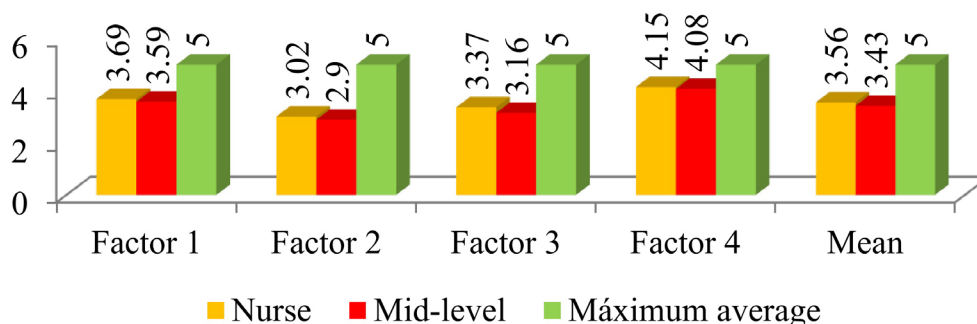
**Table 3** - Empathy scores by factor according to the professional category.  
Maceio, AL, Brazil, 2015. (n=230)

Variable	n	Mean	Standard deviation	p-value
Factor 1				
Nurses	59	44.3	6.25	0.309*
Mid-level professionals	171	43.1	7.69	
Factor 2				
Nurses	59	30.2	5.95	0.222*
Mid-level professionals	171	29.0	7.00	
Factor 3				
Nurses	59	30.3	4.81	0.033†
Mid-level professionals	171	28.4	6.15	
Factor 4				
Nurses	59	37.4	4.25	0.753†
Mid-level professionals	171	36.7	5.79	
Total				
Nurses	59	142.2	12.33	0.039†
Mid-level professionals	171	137.3	18.47	

\*Used ANOVA variance analysis; †Kruskal Wallis used.



The analysis that considered the participants answers was based on the responses given by the two professional categories, according to Likert 1 to 5 alternatives, in which the average of the nurses' responses was higher, that is, with a tendency to approach 5 (maximum score and more positive for empathy) than the mid-level nursing professionals (Figure 2).



**Figure 2** - Mean of the Likert scale responses by empathy factor, according to the professional category. Maceio, AL, Brazil, 2015. (n=230)

## DISCUSSION

It is known that there is a difficulty of evaluation of empathy in the studies, mainly few possibilities of its measurement. Some research disregards the multidimensionality characteristic of empathy, which strengthens the need to propose new ways of studying it.<sup>12</sup>

The study revealed the empathy of nursing professionals who deal with physical, mental and relational stress in the emergency department. In the present study, nurses were more empathic than nursing technicians and assistants.

The findings of this study corroborate the idea that people with a higher level of education generally have greater empathy than those of the average level. This can be explained by the fact that higher education institutions have incorporated humanization practices and empathy skills, allowing the professional to act based on the integrality and singularity of the user, and not on the fragmented and technician view.<sup>15</sup>

In addition, another corroborating factor for greater empathy in higher level health professionals is the experience of undergraduate experiences that bring them closer to users in health services, participate in extramural disciplines and internships, which privilege personal skills, interpersonal relationships, empathy and resolve in health.<sup>15</sup>

It is also emphasized that, on a scale, empathy increases the higher the level of schooling. Participants with graduate programs score more in empathy than those with only undergraduate degree. They score higher than those with only high school.<sup>16</sup>

Comparatively, the empathy score obtained in this study with a research done with psychology students in an Empathy Development Program (EDP) was higher than among the nursing professionals participating in the present study, but these stood out in PA and AS.<sup>5</sup>

The empathy factors PM and AS are favored by characteristics present in the professionals studied: degree of schooling, age and sex. PM is positively influenced by the higher the level of schooling, on a scale that tends to grow from the medium to the postgraduate level. Age also raises PM over the years. Females contributes to a higher AS score.<sup>17-18</sup>

The comparison of the empathy scores of the present study with a study applied to nursing students, before their participation in a EDP, suggests that the professionals again presented higher

PM and AS with smaller difference between the scores. On the other hand, the professionals presented lower IF and AL than the nursing students. This means that they have a greater capacity to perceive the emotional state of others and to sensitize themselves to the situation of another person than the nursing students whose ability to accept other people's ideas and sacrifice for the benefit of the other was greater than among the nursing professionals of this study.<sup>3</sup>

Both comparisons carried out between the present study and the research involving students suggest a higher capacity of PM professionals, which may indicate the influence of the schooling, age and experience of the nursing professional in perceiving the feelings and perspectives of another person.

Besides the nurses in the present study are generally more empathic than the mid-level nursing professionals, they were also more altruistic. Altruism is an increased ability with the degree of schooling.<sup>17</sup> On the other hand, too much altruism can be more detrimental than beneficial, for extremely altruistic people give themselves too much and suffer from self-sacrifice.<sup>19</sup>

Altruism is inversely proportional to age, since with the passage of years it tends to happen to regulate this behavior in the sense of not becoming dysfunctional, causing more damage than benefits to those involved, which seems to be related to life experience. In this situation, the person starts to select the best moment and attitude for everyone.<sup>17</sup> The lower altruism of the nursing professionals participating in the present study, compared to that shown in nursing and psychology students in the studies cited above, may be related to the decrease of this ability, which occurs with increasing age.<sup>3-5</sup>

In this research, higher PM and AS among nursing professionals was evident and when these factors are high it means that the behavior adopted by the person tends to understand the other, to capture their feelings, as well as being able to feel compassion, interest for the state her concern for her well-being to help her.<sup>3</sup>

However, due to the lower scores in IF and AL, in a situation of conflict of ideas, these professionals may find it difficult to accept the behavior of the other and to have attitudes of irritation or intolerance. Even if it is sensitized by the unrelated situation of high AS, the lowest score in AL does not sacrifice its needs, in the sense of helping someone, which contributes to acts of selfishness, inattention and, in the nursing context of nursing, damages the caution.<sup>3</sup>

The diverse public of the emergency service is an aggravating factor: people with different social beliefs who, in some cases, break laws by committing robberies, homicides, rapes, etc. In this context, the professional needs to act in situations involving conflicts, which reinforces the importance of empathic behavior in assisting the service user.

In some countries such as Turkey, nursing focuses on the routine of procedures to attend the institution and not the needs of users through individualized care. In this situation, communication is automatic without the use of cognition and thought. To escape this mechanism, empathy can help nurses realize the need for the other in order to provide the necessary help.<sup>20</sup>

Empathy has been recognized as a fundamental characteristic of social interaction. In this way, the investigation and identification of these feelings and empathic behaviors (or their lack), as well as the proposition of intervention measures in this reality seem to be emergency to subsidize intervention proposals or programs, in order to improve the interpersonal relations in different contexts.<sup>12</sup>

In the health area, prioritizing the value of empathy from its development during or even after graduation, or seeking its improvement through the implementation of programs of development of this ability in the institutions, for professionals of medium or higher level, can provide professionals that besides technical-scientific knowledge has relational ability to act with respect to the integrality and the singularity of the subjects.<sup>4</sup>

The research was limited: the instrument was not answered in the participant's act of consent, which caused loss of instruments, withdrawal or return to the field several times as an attempt to

recover them, and resistance to acceptance due to the person's unavailability due to the demand in the workplace. In addition, an instrument was created and validated at the national level, avoiding scales translated and adapted, but the absence of international research that used this instrument made it difficult to correlate results of studies in this field.

One of the biases of this research is the fact that despite being categorized according to the function they performed in the hospital, several professionals at the secondary level reported attending or having completed higher education and, therefore, scored similarly. However, the various areas of knowledge differently influence academic formation, the development of empathic behavior, and interpersonal relationships. For example, undergraduate courses in health and social sciences stimulate group discussion, which favors IF-related cognitive empathy, or present in the curricular curriculum subjects related to social skills, such as the psychology course.<sup>21</sup>

The contributions of this study stand out in pointing out the influence of the degree of schooling in the empathy of the nursing professionals, as well as to reveal that these workers in the hospital emergency department have high PM and AS, which means that they have the capacity to understand each other, to capture their feelings, to feel compassionate, to be interested in the emotional state of the other person and to worry about the welfare of the latter in the intention to help her.

The implications of this research for nursing consist in the need for future research investigating variables that may also influence the empathy of these professionals working in the emergency hospital service, in addition to research using EDP, to evaluate the efficacy of its application in the development of empathy of the patients. hospital emergency professionals.

## CONCLUSION

This study revealed that nursing professionals presented higher PM and AS than IF and AL. These factors were above 50%, that is, they scored more than half the possible points. Thus, it can be inferred that they are not deficient but can be improved. In this situation, professionals have the capacity to raise awareness, to understand the situation experienced by another person, but in a situation that creates conflict, tends to act with intolerance and inattention, which may neglect the human aspect of the profession and the care provided .

In nursing, empathy is generally associated with the professional category, and nurses were more empathic than the mid-level nursing professionals.

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## NOTES

### ORIGIN OF THE ARTICLE

Article extracted from the thesis - Empathy in nursing professionals in an emergency service, presented to the *Programa de Pós-Graduação em Enfermagem, Escola de Enfermagem e Farmácia, Universidade Federal de Alagoas*, in 2016.

### CONTRIBUTION OF AUTHORITY

Study design: Albuquerque MCS, Souza DFS.

Data analysis and interpretation: Albuquerque MCS, Souza DFS, Cavalcante JC.

Writing and / or critical review of content: Albuquerque MCS, Souza DFS, Maynard WHC, Bezerra LFD, Cassimiro ARTS, Cavalcante JC.

Review and final approval of the final version: Albuquerque MCS, Souza DFS, Maynard WHC, Bezerra LFD, Cassimiro ARTS, Cavalcante JC.

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### ETHICS COMMITTEE IN RESEARCH

Approved by the Ethics Committee in Research with Human Beings of the Universidade Federal de Alagoas under Certificate of Presentation for Ethical Appreciation (CAAE): 31506914.1.0000.5013.

### CONFLICT OF INTEREST

There is no conflict of interest.

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