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RESEARCH

COMPARISON OF THE DIAGNOSTIC ACCURACY OF UNDERGRADUATE STUDENTS AND NURSES IN RESIDENCY PROGRAMS

COMPARAÇÃO DO GRAU DE ACURÁCIA DIAGNÓSTICA DE GRADUANDOS E ENFERMEIROS EM PROGRAMAS DE RESIDÊNCIA

COMPARACIÓN DEL GRADO DE PRECISIÓN DIAGNÓSTICA DE ALUMNOS Y ENFERMEROS EN PROGRAMAS DE RESIDENCIA

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ABSTRACT

Objectives: to compare the level of diagnostic accuracy between students attending the last undergraduate year in Nursing and nursing residents, and to estimate the association between the level of diagnostic accuracy and the degree of familiarity with the nursing process, diagnosis, clinical reasoning, and the ability degree to establish nursing diagnoses. **Method:** this was a cross-sectional descriptive and exploratory study. The 65 participating subjects were 27 undergraduates attending the last year of nursing school, 19 first year resident nurses, and 19 second year resident nurses. Two instruments were used: characterization of participants and clinical case. The degree of diagnostic accuracy was evaluated by the Escala de Acurácia de Diagnósticos de Enfermagem (Accuracy Scale of Nursing Diagnoses) - Version 2. Data were analyzed through descriptive and inferential statistics. **Results:** the mean age of participants varied from 22 to 26 years and most were females. There was no statistically significant difference regarding the self-reported ability to establish nursing diagnoses and the degree of clinical contact with the nursing process, diagnoses, and clinical reasoning in the theoretical and practical contexts. It was observed that the second year residents identified a significantly smaller number of low accuracy diagnoses compared to the other participants. **Conclusion:** the results suggest that the residency programs contribute to improving diagnostic accuracy.

Keywords: Nursing Diagnosis; Nursing; Inservice Training.

RESUMO

Objetivos: *comparar o grau de acurácia diagnóstica entre estudantes do último ano de graduação em ENFERMAGEM e de enfermeiros residentes, e estimar a associação entre o grau de acurácia diagnóstica e o grau de contato com processo de enfermagem, diagnóstico de enfermagem, raciocínio clínico e o grau de habilidade em estabelecer diagnósticos de enfermagem.* ***Método:*** *trata-se de estudo descritivo-exploratório transversal. Participaram 65 sujeitos, dos quais: 27 graduandos do último ano de Enfermagem, 19 enfermeiros residentes do primeiro ano e 19 do segundo ano. Utilizaram-se dois instrumentos: caracterização dos participantes e caso clínico. O grau de acurácia diagnóstica foi avaliado por meio da Escala de Acurácia de Diagnósticos de Enfermagem - versão 2. Os dados foram analisados por meio de estatística descritiva e inferencial.* ***Resultados:*** *os participantes tinham idade média entre 22 e 26 anos e a maioria era do sexo feminino. Não houve diferença estatisticamente significativa quanto à habilidade autorreferida para estabelecer diagnósticos de enfermagem e grau de contato com processo de enfermagem, diagnósticos de enfermagem e raciocínio clínico nos âmbitos teórico e prático. Verificou-se que os residentes do segundo ano identificaram número significativamente menor de diagnósticos de baixa acurácia.* ***Conclusão:*** *os resultados sugerem que os programas de residência contribuem para melhorar a acurácia diagnóstica.*

Palavras-chave: *Diagnóstico de Enfermagem; Enfermagem; Capacitação em Serviço.*

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RESUMEN

El objeto del presente estudio fue comparar el grado de precisión diagnóstica entre estudiantes del último año de enfermería y de enfermeros residentes y estimar la asociación entre el grado de precisión diagnóstica con el grado de contacto con el proceso de enfermería, diagnóstico de enfermería, razonamiento clínico y grado de habilidad de establecer diagnósticos de enfermería. Se trata de un estudio exploratorio descriptivo de corte transversal. Participaron 65 sujetos de los cuales 27 eran alumnos del último año de enfermería, 19 eran enfermeras residentes del primer año y 19 del segundo año. Se utilizaron dos instrumentos: caracterización de los participantes y caso clínico. El grado de precisión diagnóstica fue evaluada por la Escala de Precisión de Diagnósticos de Enfermería - Versión 2. Los datos fueran analizados por estadísticas descriptivas e inferenciales. La edad promedio de los participantes varió entre 22 y 26 años y la mayoría era del sexo femenino. No se observaron diferencias estadísticamente significativas con relación a la habilidad auto referida para establecer diagnósticos de enfermería y grado de contacto con el proceso de enfermería, diagnósticos de enfermería y razonamiento clínico en los ámbitos teórico y práctico. Se observó que los residentes del segundo año identificaron una cantidad significativamente menor de diagnósticos de baja precisión. Los resultados indican que los programas de residencia contribuyen a mejorar la precisión diagnóstica.

***Palabras clave**: Diagnóstico de Enfermería; Enfermería; Capacitación en Servicio.*

INTRODUCTION

Nursing diagnoses are the core elements of clinical practice because they communicate human responses to health situations in which nurses can intervene.[1] It is known that the diagnosis of human responses is complex and requires different skills in the diagnostician.[2, 3] Nevertheless, the literature has shown that accurate diagnoses allow achieving better health outcomes in people.[4,5]

The concept of diagnostic accuracy in nursing was based on the assumption that various nursing diagnoses are possible in the same clinical situation. This means that different diagnoses may be acceptable; however, the nurse should identify the one that best expresses the human response according to data collected from the patient/family/community. Considering this concept, the diagnostic accuracy is not a dichotomous variable but a *continuum* of possibilities in which among the acceptable diagnoses for a particular case, there will be those highly accurate and others of low accuracy.[6,7]

Some scales are available to evaluate the diagnostic accuracy, among which, we can cite the *Lunney Scoring Method for Rating Accuracy of Nursing Diagnoses* (LSM).[8] This scale was adapted to Brazilian Portuguese. However, it did not show acceptable reliability estimates.[8]

In order to provide a method to evaluate the diagnostic accuracy of written case studies, Brazilian authors proposed Escala de Acurácia de Diagnósticos de Enfermagem EADE - version 2.[9] based on the LSM. Its use implies the analysis of identified clues that support the nursing diagnoses. In the scale's application, the presence of clues is assessed dichotomously. According to the EADE authors, clues are evidence, traces or signs, and symptoms of the nursing diagnosis being evaluated. If the evaluator considers that there are no clues to the diagnosis, the scale should not be applied. If there are clues, the evaluation of relevance proceeds (degree in which the clue is required to indicate the diagnosis), specificity (degree in which the clue is characteristic of the diagnosis), and consistency (degree in which the clue is consistent with the diagnosis). These three attributes are also assessed dichotomously for high/moderate and low. Specific scores are attributed to answers to each item on the scale, which at the end are summed up and generate a final scoring that ranges from zero to 13.5. Depending on the score obtained, the degree of diagnosis accuracy can be classified as null (score = 0), low (score = 1), moderate (scores 2 to 5.5), and high (scores 9 to 13.5).

The use of EADE – version 2 has been reported in the literature. As an example, it was used to analyze the diagnosis accuracy of "acute pain" after the implementation of a systematic evaluation of pain. The authors observed an increase in the frequency of identification of this diagnosis; however, it was not followed by improvement in diagnosis accuracy.[10]

It is known that for a nurse to be a good diagnostician, that is, able to identify accurate diagnoses, she must develop competencies: intellectual, technical, and interpersonal.[2] These competencies are necessary for the critical thinking process and can be developed and/or improved.[3] Studies showed that academic strategies such as training, courses, and emphasis on disciplines related to this subject are able to improve diagnostic accuracy in nursing undergraduate students and nurses.[11,12]

Residency programs in Nursing are an opportunity to bring the newly graduated nurse close to the actual clinical experience and aimed at the development of technical-scientific and ethical skills through the in-service training.[11] A systematic review demonstrated the efficacy of residency programs regarding the development of clinical competence, confidence, and critical view.[12]

Little is known about the contribution of residency programs in Nursing to the improvement of diagnostic accuracy in nurses. It is believed that education, through in-service training, helps to improve diagnostic accuracy in resident nurses, and the degree of diagnostic accuracy is greater the longer the time has elapsed in the course.

The objectives of this study were: a) to compare the degree of diagnostic accuracy between students in their final year

as undergraduate Nursing students and resident nurses; b) to estimate the association between the degree of diagnostic accuracy to the degree of contact with the nursing process, diagnosis, clinical reasoning, and the degree of ability in establishing nursing diagnoses.

METHOD

This was a descriptive and exploratory, cross-sectional study with a quantitative approach, whose data were collected from June to November of 2014. This study was approved by the Research Ethics Committee of the University of São Paulo School of Nursing (EEUSP) process number 714001; CAAE: 32529014.9.0000.5392. The researchers followed the provisions of Resolution 466/2012, and all participants gave their consent.

Population and sample

The study population consisted of all residents enrolled in residency programs in Nursing (N = 77) at EEUSP in 2014; 42 first year residents (GR1) and 35 second year residents (GR2). To verify the contribution of residency programs in the diagnostic accuracy of resident nurses, we choose to compare their performance with that of undergraduate students enrolled in the final year of the Nursing course (fourth year). Considering the sample power as 95% and type I error as 5%, the undergraduate group should be composed of 28 participants (GG).

To be included in the study, residents should have attended the discipline related to the nursing process; furthermore, residents and undergraduate students should express their consent to participate. Residents who were on sick leave were excluded from the study.

Data collection

Two data collection instruments were developed for this study: characterization of participants and clinical case.

The characterization instrument comprised sociodemographic data, data related to the degree of contact with the nursing process, nursing diagnoses, clinical reasoning, and self-evaluation on diagnostic ability. The degree of contact and diagnostic ability were self-reported using a 5-point Likert-type scale such as 1 = none, 2 = little, 3 = substantial, and 4 = very.

The instrument "clinical case" comprised a written case study prepared in a previous study[9] (whose authors have provided permission for use in this study), and instructions for participants to identify the nursing diagnoses and record them in the indicated location.

The instruments were personally given to participants. The guidelines for filling up the instruments were read along with each participant to clarify any doubts. Participants were instructed that the resolution of the case study should be performed individually, and the NANDA – International (NANDA-I) nursing diagnoses classification[1] could be consulted.

Determination of the degree of diagnostic accuracy

The authors of the written case study sent the possible nursing diagnoses and their respective degrees of accuracy. Hence, they used the EADE – version 2[9] and the NANDA-I nursing diagnoses classification, version 2007-2008. A new template of responses was necessary to be established because of alterations in relation to diagnoses approved by NANDA-I in its latest versions (2009-2011 and 2012-2014).[13,14]

Therefore, all diagnoses identified by the participants were transcribed in an Excel® spreadsheet, which was drawn up according to the EADE items – version 2.[9] Along with the case study, this material was presented to the members of the Nursing Diagnoses, Interventions, and Outcomes Study Group from EEUSP. Members of the research group analyzed all diagnoses identified by undergraduate students and residents after carefully reading the study case. Other diagnoses were added to the list of identified diagnoses in order to detect possible bias in the evaluation of the research group members. The new response template was established by consensus, and the diagnoses were classified according to their degree of accuracy (null, low, moderate, and high).

Data analysis

Data were recorded in an Excel® spreadsheet and transported to the *Statistical Package for Social Sciences* (SPSS) version 22.0 to perform the analyses. Quantitative variables were analyzed using measures of central tendency. Data were analyzed using absolute and relative frequencies for categorical variables.

"Undergraduates" (GG), "first-year residents" (GR1), and "second year residents" (GR2) groups were compared using the Fisher's exact test in relation to sociodemographic variables; degree of theoretical and practical contact with the nursing process, nursing diagnoses, clinical reasoning, and degree of ability to establish nursing diagnoses. These groups were also compared in the degree of diagnostic accuracy by the Jonckheere-Tepstra test. Degrees of accuracy that showed statistical difference were compared between pairs of groups, i.e., GG *vs.* GR1, GR2 *vs.* GG, and GR1 *vs.* GR2 by the Mann-Whitney test.

The Kendall correlation test was used to estimate the association between the degree of diagnostic accuracy and degree of contact with the nursing process/diagnosis, clinical reasoning, and degree of ability to establish nursing diagno-

ses. Therefore, the diagnostic accuracy was treated as a continuous variable, considering the numbers of high, moderate, and null accurate diagnoses for each participant; the self-assessment on the degree of contact and diagnostic ability was treated as an ordinal variable.

In all cases, the descriptive level (p-value) <0.05 was considered statistically significant.

RESULTS

Sample characterization

During the data collection period, 77 residents (excluding the author of this study), and 42 as first and 35 as second-year residents were enrolled in residency programs in Nursing at EEUSP. For logistic reasons, it was not possible to access the resident nurses from one of the programs (n = 18). One second-year resident refused to participate and one first year resident was discharged from the program. Thus, 29 first year residents and 27 second year residents were accessed and consent to participate. Of these, 18 did not return the filled data collection instrument. Therefore, 38 residents, 19 GR1 (65.5%) and 19 GR2 (70.3%) participated in the study. Regarding the undergraduate students, 32 were invited to participate; one refused and four did not return the instrument; 27 students comprised the GG group.

GR1 participants had on average 1.5 (+1.2) years, and GR2 had 2.0 (+0.5) years since graduation. No participant had attended a residency program previously. However, 15.8% (n = 3) of GR1 participants and 5.3% (n = 1) of GR2 claimed to have previous professional experience as a nurse; 10.5% (n = 2) of GR2 participants reported having professional experience in another area. Table 1 shows the analyzed sociodemographic and professional characteristics.

Table 1 - Sociodemographic and professional characterization of participants. São Paulo, 2014-2015

Variables	GG (n = 27)	GR1 (n = 19)	GR2 (n = 19)
Age, in years (Average)	22.6	23.6	26.2
Female gender (%)	100	78.9	94.7
Marital status			
single (%)	100	89.5	84.2
married (%)	–	10.5	5.3
separated/divorced (%)	–	–	10.5
Professional experience as a nurse (%)	NA	15.8	5.3
Professional experience in another area (%)	–	–	10.5

NA = not applicable.

There was no difference between the groups in relation to the self-reported ability to establish nursing diagnoses, nor about the degree of contact with the nursing process, nursing diagnoses, and clinical reasoning in the theoretical and practical contexts (Table 2).

Table 2 - Percentage distribution of participants according to the self-reported ability to establish nursing diagnoses and degree of contact with the nursing process, nursing diagnoses, and clinical reasoning in the theoretical and practical contexts. São Paulo, 2014-2015

	GG (n=27)	GR1 (n=19)	GR2 (n=19)	Total (n = 65)	*p-value
NP- theoretical					
Low	7.4	10.5	5.3	7.7	0.964
Considerable	51.9	57.9	57.9	55.4	
High	40.7	31.6	36.8	36.9	
NP- practical					
Low	14.8	10.5	10.5	12.3	0.190
Considerable	63	57.9	21.1	49.2	
High	22.2	31.6	68.4	38.5	
ND- theoretical					
Low	11.1	10.5	0	7.7	0.494
Considerable	37	42.1	57.9	44.6	
High	59.1	47.4	42.1	47.7	
ND- practical					
Low	7.4	5.3	10.5	7.7	0.141
Considerable	51.9	57.9	21.1	44.6	
High	40.7	36.8	68.4	47.7	
CR- theoretical					
Low	22.2	10.5	10.5	15.4	0.367
Considerable	44.4	73.7	57.9	59.6	
High	33.3	15.8	31.6	27.7	
CR- practical					
Null	3.7	0	0	1.5	0.984
Low	18.5	15.8	15.8	16.9	
Considerable	37	47.4	36.8	40	
High	40.7	36.8	47.4	41.5	
Diagnostic ability					
Low	22.2	15.8	5.3	15.4	0.086
Considerable	74.1	63.2	63.2	67.7	
High	3.7	21.1	31.6	16.9	

NP: nursing process; ND: nursing diagnosis; CR: clinical reasoning; *Fisher's exact test.

Degree of diagnostic accuracy in undergraduate students and resident nurses

Participants identified 7.3 (SD = 2.3) diagnoses on average. Undergraduate students scored significantly more diagnoses than the residents nurses (8.3, SD = 2.7 *vs* 6.6; SD = 2.4; p = 0.01). The number of diagnoses identified by GR1 and GR2 participants was similar (6.4 ± 2.5 *vs* 6.8; SD = 2.4; p = 0.64).

Proportionally, participants from the three groups identified more high accuracy diagnoses (GG = 56.0%, GR1 = 54.9%, and GR2 = 62.0%), followed by low accuracy ones (GG = 31.8%, GR1 = 28.7%, and GR2 = 24.8%). The average number of diagnoses identified by the participants of GG, GR1, and GR2 groups was calculated to compare groups in the varying degrees of accuracy (high, moderate, low, and null) as shown in Table 3.

Table 3 - Comparison of the number of diagnoses, average (standard deviation), identified by the participants of GG, GR1, and GR2 groups according to degrees of accuracy. São Paulo, 2014-2015

Degrees of accuracy.	GG (n=27)	GR1 (n=19)	GR2 (n=19)	Total (n = 65)	p-value*
High, average (standard deviation)	4.6 (1.6)	3.5 (1.3)	4.2 (1.6)	4.2 (1.6)	0.271
minimum-maximum	2–8	2-5	1-8	1-8	
Moderate, average (standard deviation)	0.4 (0.6)	0.5 (0.8)	0.6 (0.8)	0.5 (0.7)	0.339
minimum-maximum	0-2	0-2	0-2	0-2	
Low, average (standard deviation)	2.6 (1.4)	1.8 (1.3)	1.7 (1.2)	2.1 (1.4)	**0.023**
minimum-maximum	1-6	0-5	0-4	0-6	
Null, average (standard deviation)	0.6 (0.8)	0.6 (0.8)	0.3 (0.4)	0.5 (0.7)	0.254
minimum-maximum	0-3	0-2	0-1	0-3	

GG - Undergraduate students group; GR1- first-year residents group; GR2 - second-year residents group; *Jonckheere Terpstra-test.

No difference was observed between GR1 and GR2 (p = 0.718) in the pairwise comparison between groups to identify low diagnostic accuracy. GG participants tended to identify more low diagnostic accuracy than GR1 participants (p = 0.071). When compared to GR2, the number of low accuracy diagnoses identified by GG participants was significantly higher in the GG group (p = 0.033).

Degree of diagnostic accuracy, diagnostic ability, and degree of contact with the nursing process, nursing diagnoses, and clinical reasoning

The theoretical or practical contact with the nursing process, nursing diagnoses, clinical reasoning, and self-reported diagnostic ability showed a very weak association, or practically null, with the degree of diagnostic accuracy (all associations with p-value >0.05) as shown in Table 4.

Table 4 - Association between the degree of diagnostic accuracy with diagnostic ability and degree of contact with the nursing process, nursing diagnoses, and clinical reasoning among nursing students and residents. São Paulo, 2014-2015

	High Accuracy	Moderate Accuracy	Low Accuracy	Null Accuracy
NP theoretical	0.060	0.004	-0.071	-0.030
p-value*	0.577	0.970	0.512	0.798
NP practical	-0.057	0.012	-0.148	-0.113
p- value *	0.596	0.918	0.170	0.330
ND theoretical	-0.002	-0.165	-0.189	-0.076
p- value *	0.985	0.159	0.083	0.514
ND practical	-0.020	0.113	-0.119	-0.074
p- value *	0.856	0.335	0.276	0.528
CR theoretical	-0.077	-0.002	0.033	-0.133
p- value *	0.465	0.988	0.757	0.247
CR practical	-0.047	0.078	0.004	-0.032
p- value *	0.653	0.496	0.970	0.780
Diagnostic ability	-0.061	0.134	0.052	-0.081
p- value *	0.569	0.247	0.630	0.484

NP: nursing process; ND: nursing diagnosis; CR: clinical reasoning; *Kendall correlation test.

DISCUSSION

In the present study, we investigated the contribution of Nursing residence programs, i.e., the in-service training for diagnostic accuracy of nurses. The main result showed that nurses in the second year of residency programs in nursing identified fewer diagnoses with a low degree of accuracy.

It was verified that the GR2 group tended to report a higher degree of practical contact with the contents of the nursing process, nursing diagnoses, and clinical reasoning, while other groups reported a higher degree of theoretical contact, although no statistical difference was observed. Unlike the observed, it was expected that the GG participants would report more theoretical contact than the GR1participants because these are professionals who perform an average of 48 hours of weekly practical activities.

Disciplines that address this issue are part of the undergraduate[15] course curriculum and of the theoretical and practical activities of residency programs in Nursing at EEUSP. It is noteworthy that the nursing process is implemented in all health services (hospitals and basic health units), which are practice fields for residents. In addition, in hospitals, the NAN-

DA-I classification is used as a reference for standard language to communicate and document nursing diagnoses.

The specific education on the use of nursing diagnoses, the diagnostic process, and the availability of a classification system are necessary precursors for diagnostic accuracy.[16] Thus, studies have shown that theoretical and practical activities are effective and efficient to produce knowledge and practical and lasting skills to academic students and nurses, essential for the development of clinical reasoning and diagnostic ability.[17,18]

In the present study, there were no differences in the degree of theoretical and practical contact with the nursing process and diagnosis as well as clinical reasoning reported by the graduate students and residents. It is possible that this finding is explained by the fact that the participants in the three groups were in the situation of transition between the academic and working world. The undergraduate students were attending trainings with a total workload of 510 hours in different intra- and outpatient units, with a view to the development of autonomy for professional practice and further understanding of the reality of being a nurse through an effective articulation between theory and practice.[15] The responses from residents, in turn, reflect intense practical contact with diagnosis and the nursing process, which is consistent with the proposal of the residency programs, i.e., teaching through work.

Most participants from the three groups were evaluated presenting considerable diagnostic skills. The answers from the undergraduate students probably reflect the status of their professional training and an overvaluation of their own diagnostic ability due to not having experienced a wide range of clinical situations and/or not having grasped the complexity of the diagnostic task. Meanwhile, resident nurses may have faced different and more complex clinical situations, which favors the development of self-knowledge[19] and make them more critical about their skills.

Interestingly, there was no association between the degree of theoretical or practical contact with the self-reported ability to establish diagnosis, degree of contact with the diagnosis/nursing process, clinical reasoning, and diagnostic accuracy. These facts are surprising because it was expected that the greater the contact with such elements or the higher the diagnostic ability, the greater would be the degree of diagnostic accuracy.

It is known that the training and expertise of nurses have a direct impact on decision-making skills, critical thinking, and clinical reasoning, which are determining factors for diagnostic accuracy.[19,20] Author proposed that the model of skills acquisition of Dreyfus could be generalized for nursing. The model takes into account that acquired skills can be improved with experience and education.[21] In this model, nurses are categorized according to their level of experience as a novice, advanced beginner, competent, proficient, and experienced.

In parallel with the groups formed in this study, it can be assumed that the GR1 group would contain participants as novices and advanced beginners because they reported less practical experience with topics related to the profession, although some already had previous professional experience as nurses. In turn, the GR2 group would contain advanced beginners and competent participants, as most reported more practical contact with professional elements needed for the nursing practice. Thus, it would be expected that GG participants (without professional experience), GR1, and GR2 would report different diagnostic skill levels, however, this was not observed in this study.

Undergraduate students scored more diagnoses than residents. Considering the model of skills acquisition of Dreyfus[21], it could be expected that the GG participants would score more diagnoses than residents because their discriminating judgment skills tend to be less developed than that observed in the GR1 and GR2 participants. Conversely, the number of diagnoses listed by the GR1 and GR2 participants was similar.

Furthermore, it was verified that the GG and GR1 groups scored a greater number of low accuracy diagnoses than the GR2 group. In fact, the EADE-2 [9] evaluates the diagnostic accuracy not only in terms of clues but also considering the relevance, specificity, and coherence of each clue in the case. Therefore, it can be inferred that the longer in-service training contributed to GR2 participants to display increased good judgment on these three attributes that the clues should have.

On the other hand, no difference was obtained between the groups with regard to identification of high-accuracy diagnosis. This can be attributed to the characteristics of the case in which the "clues" considered diagnostic of high accuracy were quite evident; furthermore, the high accuracy diagnosis of the case are common in the daily professional work and quite explored in practical activities with undergraduate students.

It is known that residency programs provide an opportunity for newly trained nurses to refine their knowledge[22] and improve critical thinking skills, communication, leadership, and clinical reasoning.[12,19] Therefore, they allow the improvement of nurses regarding specific skills and especially those seen as essential to becoming better diagnosticians.[23] The development of critical thinking and clinical reasoning is fundamental to the diagnostic task.[24] Educational actions in practice can improve the ability for decision making and judgement.[19,25]

This study has limitations. The convenience sample from a single educational institution does not allow the generalization of results. The use of one single case study, related to adult health and applied to nurses from different specialties, may have contributed to the results about degrees of accuracy. In addition, knowledge of the nursing/diagnosis process and clinical reasoning were measured indirectly through a self-reporting

system. In fact, students and professionals can under- or over-estimate their knowledge.

The estimation of the contribution of residency programs in diagnostic accuracy of nurses requires further studies considering the complexity of this issue, limitations of this study, and the limited literature on this theme. The execution of a prospective longitudinal study, which can minimize possible biases, would confirm the results of this work.

CONCLUSION

The results of this study suggest that the in-service training contributes to the refinement of clinical reasoning process of nurses, which was denoted by the lower number of low accuracy diagnoses identified in the GR2 participants. Despite this, there was no difference between groups in identifying high-accuracy diagnoses. In the studied sample, accuracy does not seem to be related to the degree of contact, theoretical or practical, with the nursing process, diagnosis, clinical reasoning, and degree of ability to establish nursing diagnoses.

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