

Forensic nursing practice - What do the students know anyway?

Bárbara Pinheiro Machado ^{a,*,1}, Isabel Maria Batista de Araújo ^b,
Maria do Céu Barbieri Figueiredo ^c

^a National School of Public Health, 1600-560, Lisbon, Portugal

^b Vale do Ave School of Health, 4760-409, Vila Nova de Famalicão, Portugal

^c Nursing School of Porto, 4200-072, Porto, Portugal



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ABSTRACT

Background: Forensic Nursing emerges as a new nursing practice, combining scientific and technical nursing knowledge with Forensic Science principles.

Objectives: To evaluate the level of knowledge about the Forensic Nursing Practices in the 4th year students of the Nursing Degree.

Methodology: A cross sectional analysis study conducted with a sample of 240 students. The Knowledge Questionnaire over Forensics Nursing Practices (KQFNP) was applied in a survey.

Results: The level of knowledge of the students of the 4th year of the Degree in Nursing was good (52.1%), sufficient (21.3%) and insufficient (26.7%), according with scale scored defined, with the existence of deficits essentially at the level of crucial aspects of the preservation of vestiges.

Conclusion: The evidence emphasizes the need of investment in the training of the students over forensic nursing practices. So, basic knowledge of forensic nursing is a critical concept to be included in core curriculum of a four-year nursing degree program.

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1. Introduction

Forensic science (FS) has been acquiring interest among the general population, promoted by media involvement [1]. In the last few years, the technological field has assisted to a great and important improvement, which enables nursing profession to meet the demands of FS. In an attempt to integrate this technological advance, training in nursing has adapted accordingly, as the profession and education in this area evolves, in order to integrate nursing as a science. That evolution was synthesized by Machado, Araújo e Figueiredo [2], and we highlight the regulation of professional practice in 1996 and the bachelor's Degree in Nursing (4 years) in 1999.

The Portuguese Civil Code [3]; pp. 69) in article 341 states that the evidence has as its function the “demonstration of the reality of the facts”. However, when intervening on the street or in hospital victim, the priority of the multidisciplinary team of health professionals is

the provision of health care [4], so preservation or tracing cannot delay or inhibit care in order to ensure adequate care of the victim [5].

As such, health professionals are often the first to make contact with the victims, and they have to preserve traces. The nurse is often the first to contact the victim (physical, sexual, religious or social violence), having a unique and privileged position not only in the care process, but also in encouraging and executing the preservation, collection and documentation of medical-legal traces [6,7].

Forensic Nursing Science (FNS) emerges as a new nursing practice, combining scientific and technical nursing knowledge with FS principles. So, the collaboration between FS and FNS, in the preservation of traces is the key to the success [6]. It is essential that nurses develop skills that enable them to provide differentiated care to victims of violence [5,8]. Therefore, arises the need to provide nursing professionals with training/skills in FN.

From the bibliographical review we realized that different research studies show that, due to failures in the training process, nurses are not always able to act in these scenarios [5,8,9]; Martins, 2017).

In the empirical approach, FN has been viewed as a multidimensional concept, encompassing several components, and a FN

* Corresponding author.

E-mail addresses: barbara.saphira@hotmail.com (B.P. Machado), isabel.araujo@ipsn.cespu.pt (I.M. Batista de Araújo), ceubarbieri@esenf.pt (M.C.B. Figueiredo).

¹ Escola Nacional de Saúde Pública, Rua da Castelhana, n°325 4770-356 Mouquim, Lisboa. Portugal.

Practice Knowledge Questionnaire (which we apply in this paper), developed by Libório and Nunes, was created.

According to the authors (2012, 2019) the measuring instrument is subdivided into six subscales according to particular aspects of FN: FN Concept, Forensic Situations, Forensic Traces used in FN investigation of suspicious situations, Reporting of the occurrence and Documentation of Evidence, General Nursing Care and Trace Preservation Care.

1.1. Research question

What is the existing forensic nursing knowledge of 4th year nursing students enrolled within a BSN program at December during February time frame?

2. Methods

The project was conducted using a cross sectional analysis study. The sample size was 240 convenient selected students completing the 4th year of nursing graduation in three higher education institutions situated in the northern region of Portugal. The data were collected, after students' informed consent was received, during the months of December to February of 2019. All the participants were voluntary, after study explanation, all the students who did not want to participate, leave the room without any loss. The data collection instrument was a survey. Each student completed the survey in classroom time. The teacher in charge was present during questionnaire's appliance, and all questionnaires were completed and collected. All the ethical aspects inherent to human research were respected by the study (e.g. authorization request to the higher education institutions with reference 2019/CE/P004(2857CETI)).

The questionnaire comprised two sections. The first section contained a set of questions for sociodemographic characterization and general questions about FN (FN training, work done in the FN area in the Nursing Degree Course, clinical situations experienced in clinical teaching, legal medical protocols at the internship/clinical teaching sites, extracurricular FN training). The second section intended to evaluate the level of knowledge over forensics practices in nursing students through the Knowledge Questionnaire over Forensics Nursing Practices (KQFNP) [10]. The tool presented good internal consistency with the consistency value for the overall score of 0.807 [11]. The reliability, evaluated by global Cronbach's alpha (α) coefficient, was of 0.807 [10]. In the psychometrics analysis, the tool obtained a KR-20 statistic overall score of 0.732 and the overall ICC was 0.767 [12].

The KQFNP is an instrument that aims to assess the level of knowledge over forensics practices of the population where it is applied. This scale is composed of included 74 dichotomous statements (true or false) which integrate the six dimensions (concept of forensic nursing, forensic situations; forensic traces; communication and documentation of evidence, care in preserving traces dimensions assessed in statements 1–10, 11–22, 23–34, 35–44, 45–54 and 55–74, respectively) [10]. Each of the KQFNP items was assigned into a score of 0 if incorrect response, or 1 if correct answer. The overall score of knowledge on Forensic Nursing Practice (FNP) can range between 0 and 74 points (integer values). The higher the score, the better the overall knowledge level. However, in order to be able to objectify the analysis of different subscales, since they do not have all, the same number of items, has been converted all scores in percentage, using the formula:

$$\text{Score (\%)} = \frac{\text{Score} - \text{minimum}}{\text{maximum} - \text{minimum}} * 100$$

In order to facilitate the interpretation of these scores, they were

converted to a categorical scale, following the Pestana & Gageiro [13] instructions (Mean \pm 0.25standard deviation): Insufficient \leq 79.48; Sufficient $>$ 79.48 and $<$ 84.52; Good \geq 84.52. The scale developed by Cunha, Libório and Coelho [10] is available for online consultation, valid for the Portuguese reality.

The collected information was analyzed by Statistical Package for Social Sciences (version 25) using descriptive statistical analysis (counts, percentages, means, and standard deviations) and inferential analysis (e.g. Spearman's rho and the Mann–Whitney *U* test). For the tests, a statistical significance level of 0.05% was used.

3. Results

3.1. Sample characterization

The 240 students participating in this study included 209 females (87.1%) and 31 males (12.9%), aged between the ages of 20 and 42. For females the maximum age was 42 years old, while for the male was 34, with a minimum of 20 years and 21 years respectively (Table 1).

3.2. Characterization of the general variables about FN

All students reported not having received training in the Nursing degree in FN. Most students did not work in Nursing Degree on FN (97.9%) and those who did (2.1%) the theme was marital violence, violence against the elderly or children. Most students did not attend extracurricular FN training (99.2%). Those attending (two students) attended conferences or workshops.

Students mostly report not knowing about the existence of protocols for medical-legal situations in the internship places they attended (80%), followed by those who said they did not exist (10.8%), and finally those who reported that they existed (9.2%) (Board 1).

The most clinical experiences by the students were traffic accidents and/or wounds (21.3%), gunshot or knife wounds, traffic accidents and/or wounds (13.33%), negligence, accidents of traffic and/or trauma (11.3%), marital violence, violence against the elderly or children, traffic accidents and/or trauma (7.5%) and least negligence (5.4%). However, it was possible to understand that the students didn't know they were caring out care for a "forensic" patient.

3.3. Knowledge of FN practices

The students' overall knowledge score ranged from 18 to 72 points, with a mean of 60.9 (Standard Deviation = 7.45). Knowledge was assessed through the different items that make up the scale and that were built and validated for this purpose. Considering that the expected global knowledge score ranges from 0 to 74, this result indicates that, on average, students correctly answered 82.3% of the items of the FN Practice Knowledge Questionnaire, revealing that they had some knowledge about FN Practices. In the six subscales the global score range between minimum values of 1 and maximums of 20 (Table 2).

The percentage of correct answers per item was 82.3% or greater in 51 items of the FN Practice Knowledge questionnaire. No item

Table 1
– Sociodemographic characteristics of students attending the Nursing Degree course (n = 240).

Sex	N (%)	Mean	Median	Minimum values	Maximum values
Female	209 (87.1)	21.96	21	20	42
Male	31 (12.9)	22.45	21	21	34
Total:	240	22.02	21	20	42

Table 2
- Knowledge about FN Practices (subcategories) of students attending the Nursing Degree course (n = 240).

Scale dimensions	Minimum value	Maximum values	Expected Score	Mean	Standard deviation
FN concept	2	10	[0–10]	8	1.63
Forensic situations	4	12	[0–12]	10.92	1.61
Forensic traces	2	12	[0–12]	10.69	1.88
Communication and documentation	1	10	[0–10]	8.69	1.62
FN general care	3	10	[0–10]	8.63	1.57
Traces preservation	4	20	[0–20]	13.97	2.36
FN Global Knowledge Score	18	72	[0–74]	60.9	7.45

registered 100% correct answers. Item 8 “The Science of Forensic Nursing combines the clinical approach to the victim of violence with the trace of this situation” was the one with the highest percentage of correct answers (95%) in the subscale called FN Concept. Item 11 “Gunshot or whiplash injuries may correspond to forensic cases” was the one with the highest percentage of correct answers (99.6%) in the subscale called Forensic Situations. Items 23 “Traces of blood can be used in the investigation of forensic cases” and 37 “The nurse should inform the victims about available protection and support resources and how to obtain them” were the ones that obtained the highest percentage of correct answers (98.3), in the Forensic Traces and Communication and Documentation subscales, respectively. Item 47 “The collection and preservation of traces contributes to safeguarding the rights of the victim”, was the one that registered the highest percentage of correct answers (96.7%) in the subscale called FN General Care and finally, item 55 “When approaching the victim, gloves should always be worn, changing them frequently to avoid cross contamination.” percentage of correct answers (97.1%) in the Trace Preservation subscale.

Regarding incorrect answers, we found that in 23 items the percentage of incorrect answers is higher than 17.7%. In the FN Concept subscale the item that presented the highest percentage of incorrect answers was 5 “Forensic Nursing includes the provision of Nursing care to aggressors” (42.9%). At Forensic Traces dimension items 24 “Vomiting can be used in investigating forensic situations” and 26 “Stool can be considered in investigating forensic cases” were the ones with the highest percentage of wrong answers, both with 22.5%. Regarding the Communication and Documentation subscale, items 36 “Reporting of public crimes that the professional has become aware of and because of their duties always implies the consent of the victim” and 43 “In addition to the written record, the nurse should resort to photographic documentation in order to record the location and characteristics of injuries or material traces” were the ones with the highest percentage of wrong answers, with values of 34.6% and 23.3%, respectively. In the FN General Care subscale items 46 “The nurse should be prepared to take care of the victim and not to support the criminal investigation” and 45 “The nurse is usually the first professional to assist the victim, treats his

estate and reaps specimens for analysis, sometimes before the police were involved”, reported the highest percentage of incorrect answers with values of 29.6% and 28.8%, respectively. Finally, in the Trace Preservation subscale, the number of correct answers was higher compared to the other subscales, with a total of 45% wrong answers. Thus, in this the items with the highest number of incorrect answers were 63 “The top sheet (the stretcher/bed or the one on which the victim undressed) and all the garments should be placed in clean plastic bags” with 82.9%. Items 57 “The victim’s hands should be protected using elastic paper bags” and 62 “The top sheet (of the stretcher/bed or one on which the victim has undressed) and all items of clothing should be worn in clean paper bags”, both with 79.2%. Item 69 “In firearm injuries, puncture of the central veins should be avoided, preferably using the backs of the hands” with 68.8%.

As already mentioned, the higher the overall score obtained in the FN Practice Knowledge Questionnaire, the better the respondents’ knowledge. Respondents’ knowledge was categorized as insufficient, sufficient and good. In general, students have a good level of FN Practice Knowledge (highest level on the scale). As illustrated in Fig. 1 at the top 125 students (52.1%) have a good level of knowledge about FN practices, followed by 64 (26.7%) insufficient and 51 (21.3%) sufficient (Fig. 1).

Particularly the analysis for the six subscales, we verified that the Forensic Situations dimension is the one that presents the best results. We also found that in all dimensions except FN General Care and Forensic Situations more than half of respondents are insufficient or sufficient. The dimension Trace Preservation and FN Concept are the dimensions with the lowest overall score, with a representative number of students achieving an insufficient level. It was also observed that in the Forensic Traces dimension none of the respondents obtained the good level of knowledge.

4. Discussion

The results highlight the lack of integration of FN as identified in a previous article by the same authors [2]. Students’ level of knowledge in FN, on average, is good (52.1%). These results should

Board 1

General variables about FN of undergraduate Nursing students (n = 240).

Variable	Frequency		Percent (%)		Comments	
	Yes	No	Yes	No		
Receive training from FN in Nursing Degree	0	240	0	100	Subject area: Marital Violence, Violence against the Elderly or Children. Type of training attended: Conferences and/or workshops.	
Perform work written on FN in Nursing Degree	5	235	2.1	97.9		
Attend extracurricular training in FN	2	238	0.8	99.2		
Variable	Frequency		Percent (%)			
	Yes	No	Do not know	Yes	No	Do not know
Existence of protocols for legal medical situations at the internship institution	22	26	192	9.2	10.8	80

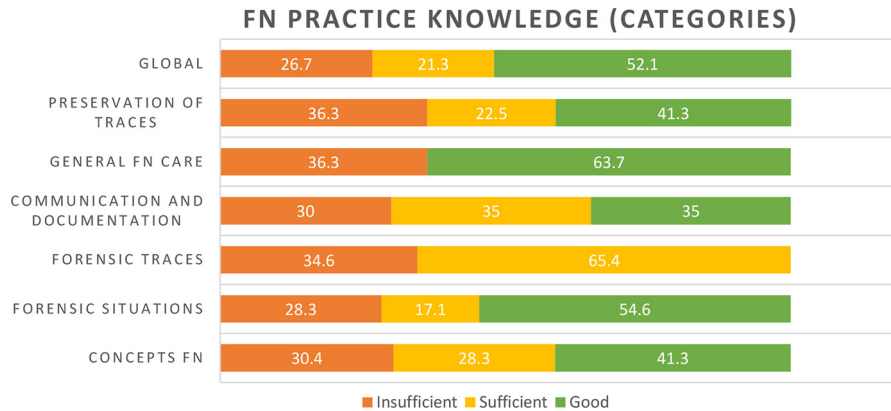


Fig. 1. FN practice knowledge (categories).

be carefully considered, as the response being dichotomous, students have a 50% chance of getting the correct answer at the outset. These data corroborate the results obtained by Cunha and Libório, in which students correctly answered, on average, 78.7% of the questionnaire items, revealing that they had knowledge about FN Practices.

The FN Practice Knowledge questionnaire comprises six sub-categories. In the category “FN Concept” it was found that most students presented knowledge about this area of intervention. However, we highlight the percentage of incorrect answers of 42.9% in item 5 “Forensic nursing includes the provision of nursing care to aggressors”. These results corroborate the results obtained by Libório e Nunes [11]. However, according to the Portuguese EF Association (APEForense), the Forensic Nurse presents as competency “Develops his activity with offenders (...)” [14]; p. 11), their rehabilitation and reintegration is one of the focus of the FN intervention [5].

In the Forensic Situations subscale, we highlight a higher percentage of incorrect answers in the items related to “injuries” and “traffic accidents”, which constitute as forensic situations. Again, these results corroborate those obtained by Libório and Nunes [11]. The nurse should be prepared to identify situations resulting from trauma, such as domestic violence, abuse and neglect of the elderly and children. In all these situations, the nurse must identify unexplained trauma situations or without witnesses, food shortages, hygiene care, among others [15,16]. Whether in domestic violence or in situations of abuse to the elderly, the work of the professional is often hampered by the victim himself, who blames himself for the abusive situation, delaying the call for help. These situations are often underdiagnosed and underreported, with misinterpretation of the traumatic injuries themselves as there is no preconceived pattern [15].

In our society we have experienced several moments of war and terrorist attacks, with deaths all over the world. For Gomes [15], nurses with FN competences will be able to participate in the management of disasters, which include mass deaths, human rights missions, and violence epidemiology investigations, among others. The nurse intervenes with the victim and his family.

In the Forensic Traces subscale, although students have shown to know the main forensic traces used in research such as blood, semen and vaginal fluids, we find that there are others who are almost completely unaware. Thus, item 24 “Vomiting (...)” and 26 “Feces (...)” recorded a percentage of incorrect answers of 22.5%. Traces are the basis of condemnation. If the nurse does not know how to identify the traces, he will not be able to protect them and thus may jeopardize the criminal investigation for loss of evidence [16]. Braz [17] states that feces can be examined as a trace. Thus, the

results seem to corroborate the conclusions of the study by Gonçalves [18], in which nurses report a vague knowledge in the maintenance of tests, lack of knowledge and lack of training in the area. This emerges, therefore, as a necessity of Nursing, in the degree course and which extends during the professional exercise.

In the Communication and Documentation subscale, we highlight item 36 “Reporting of public crimes that the professional has become aware of and because of their duties always implies the consent of the victim”, with 34.6% of incorrect answers. There is confusion regarding the crimes considered, public crimes. Public crimes are those in which it is sufficient for the Public Prosecution Service to be aware, by any means, of its occurrence to institute the criminal process. The criminal proceeding begins with the news of the crime, and can take place through the filing of a complaint by any citizen, regardless of the victim’s wishes [19]. Examples of public crimes include murder, kidnapping, child sexual abuse, domestic violence [20]. In Portugal, the criminal procedure code states that, when health professionals become aware of crimes in the performance of their duties and because of them, they should report to the competent authorities [21]. These results corroborate those of Silva’s study (2011), in which, regarding sexual crimes, 41.9% of nurses did not fully know the legal framework.

In the General FN Care subscale we highlight the percentage of incorrect answers recorded in two items. Item 45 “The nurse is usually the first professional to assist the victim, treats his estate and collects specimens for analysis, sometimes before the police are involved” and item 46 “The nurse must be prepared to take care of the victim and not to support the criminal investigation”. When the victim enters the health unit, the multidisciplinary team of health professionals join forces in a primary attempt to save the victim’s life. However, this is where nurses play a major role in preserving traces [1,22].

The nurse is often the first to contact the victim, having a privileged position not only in the care process, but also in encouraging and executing the preservation, collection and documentation of medical-legal traces [5–7].

In the Trace Preservation subscale, there is the highest percentage of incorrect answers, which are in line with other studies [11,23]. Most students are unaware that paper bags should be used instead of plastic bags for the correct preservation of traces, with a percentage of incorrect answers in items 56 and 57; and in items 62 and 63. The importance of using paper bags over plastic bags is important in preserving biological traces (avoiding the acceleration of degradation) [5,24].

The subscale where the students obtained the best results was the Forensic Situations and where they obtained the worst results were Preservation of Forensic Traces. These results should alert us

to their impact on our daily practices and safeguarding the victim's rights of legal defense. Students demonstrate lower levels of knowledge in this area of practice where nurses may play a leading role as they are often the first to contact the victim [6,7]. These results seem to have repercussions on the practical exercise, with studies showing that nurses perceive that their knowledge is not rigorous in most traces preservation procedures [25] and, with studies concluding that the approaches of health professionals adversely affect the resolution of forensic cases [25,26]. Research data show that nurses are unaware of 23% of procedures and 46% of vaguely known procedures, with 60% of procedures not performed and only 33% of procedures performed [4]. These data are confirmed by other studies that found that nurses are not aware of the possibility of traces when they receive a victim, which reveals their low level of knowledge and execution in the area of FN [18,25]. Another problem is that some of the policies and procedures aren't in place within the clinical setting, what difficult the nursing work. Therefore, in order to ensure better care for FN, studies indicate that the Nursing Degree course should include FN content to provide professionals with certain skills so that they can provide better care to victims of crime [25,27].

In the present study, the frequency of extracurricular training in FN was mentioned only by 2 students, who attended conferences/workshops. These results contradict those of the study by Libório and Nunes [11], but they are in agreement with those of Gonçalves [18] and Silva [28], which found a deficit of FN training in the nurses' class. Gonçalves [18] states that many traces are lost when the victim needs hospital care, such as clothes, blood, pieces of objects and others, or are lost due to cross-contamination, because there are no proper protocols or professionals are unaware. In this study it was possible to verify that most students were unaware of the existence of protocols for legal medical situations, followed by those who stated that there were no protocols. This lack of knowledge and application of protocols often undermines medical legal expertise. The data corroborate the results obtained by Libório and Nunes [11], in which 86.3% of the students could not say if there were any legal-medical protocols in the places where they had done clinical teaching. Correlate with occur with the student knowledge, reality of practice in the clinical setting shows that nurses of the emergency services mention the need to improve forensic practices, namely through the creation and implementation of protocols for a fruitful and efficient intervention in the care of an individual victim of crime [29].

The literature tells us that nurses are aware to this new reality of FN. Nurses are motivated by the search for new knowledge in the field of FN, in order to provide victims with a more holistic care [30,31]. These limitations that health professionals feel derive from the scarce or null approach of these competences at the Nursing Degree course level [32], with Gomes (2016) study, who stated that it is urgent to invest in forensic training for nurses. So, we suggest a nationwide nursing curriculum standard in place for forensic nursing and a replication of the present study at the national level.

5. Conclusion

Knowledge could be defined as skills acquired through experience or education or the theoretical or practical understanding of a subject. So, the main conclusion highlighted the good level of knowledge about FN Practices, especially females and non-holders of extracurricular training in FN. The insufficient level was found in 26.7% of respondents. We can realize that the comprehension showed by the students about FN Practice, didn't result directly from the studding program, but came from for other experiences.

Nurses are the largest group of caregivers and the most consistent point of contact with victims. During their practice, they have the

opportunity and the responsibility to contribute to the victim's defense, based on a good traces preservation. It is therefore important to improve their knowledge about FN Practices, specially, in the Forensic Traces dimension where none of the respondents obtained the good level. Nurses' interventions in FN field and throughout patients' life cycles it's essential for a more holistic practice and optimal victim care. It is important to continue developing research in this specific area, which deepens knowledge about the FN levels of the nursing population, in order to decrease the gaps in current practices.

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Declaration of competing interest

None of the authors has a conflict of interest.

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