

1 **Abstract**

2

3 *Introduction-* Violence is a major public health problem worldwide. Emergency nurses  
4 are often in a unique position to identify, assess, evaluate, and treat these patients, but  
5 there is limited forensic knowledge and skills to enable emergency nurses to feel  
6 confident to guide their practice in New Zealand. The purpose of this study was to  
7 establish the level of forensic knowledge and skills currently known and used by nurses  
8 in clinical practice working in New Zealand District Health Boards (DHB)'s emergency  
9 departments. The study aimed to develop a tertiary education course based on the needs  
10 and the knowledge required, to enable nurses to practice confidently and safely with  
11 Forensic patients in the emergency department setting.

12 *Methods-* A descriptive approach using online questionnaires including both  
13 quantitative and qualitative components was sent to all emergency departments in New  
14 Zealand DHB's as well as the New Zealand Nurses Organisation (NZNO) emergency  
15 nurses' section. Open-ended questions were analysed by thematic analysis. Closed  
16 questions were analysed by SPSS version 15 data analysis software (SPSS Inc, Chicago,  
17 IL). Themes identified focused on the knowledge and skills emergency nurses currently  
18 possess and the level of specialist education required to ensure patients receive the best  
19 medicolegal care.

20 *Results-* Results of the questionnaire revealed limited knowledge in being able to  
21 correctly identify all forensic patients, insufficient knowledge around evidence  
22 preservation and collection and limited knowledge around legislation or legal processes  
23 governing clinical care were discovered. However, 84% of all participants felt that  
24 having forensic knowledge was important for their practice, indicating a need for

25 increased forensic education. Practice implications indicate that forensic education is  
26 warranted, needed and desired among ED nurses within the clinical setting.

27 *Discussion-* As forensic patients generally require emergency medical attention, it is  
28 important that nurses as part of the front-line first responders have forensic knowledge  
29 around preservation and collection of evidence during the provision of medical care. It  
30 was found that, emergency nurses do not have enough knowledge around forensic  
31 issues indicating that forensic education is warranted, needed and desired among ED  
32 nurses within the clinical setting. The study also provides support for the  
33 implementation of tertiary forensic science nursing postgraduate study in New Zealand.

34  
35

## 36 **Introduction**

37 Hospital emergency departments are often the first place a victim and/or perpetrator of  
38 violence will be brought to for medical treatment. Emergency nurses are uniquely  
39 positioned to identify, evaluate, and treat these patients. Violence as defined by the  
40 World Health Organisation (2019) is “the intentional use of physical force or power,  
41 threatened or actual, against oneself, another person, or against a group or community,  
42 that either results in or has a high likelihood of resulting in injury, death, psychological  
43 harm, maldevelopment, or deprivation”[1]. Violence is a major public health problem  
44 worldwide with half a million people being murdered each year and millions more  
45 children, women and men suffering from the consequences of violence in homes,  
46 schools and communities [2]. Violence of any kind has been strongly linked to negative  
47 health consequences across the lifespan. Growing research is showing that these health  
48 consequences not only include physical injuries but a wide spectrum of negative

49 behavioural, cognitive, mental health, sexual and reproductive health problems, chronic  
50 diseases and social effects [2, 3, 4, 5]. Additionally, those who experience violence  
51 access the health care system two to two and half times as often as those not exposed to  
52 violence. This is not only directly related to the violent event itself but also secondary  
53 effects such as chronic pain, gastrointestinal symptoms, fertility and pregnancy  
54 problems, substance use problems and psychological problems [6,7]. Furthermore,  
55 research shows that patient's health could be improved if health professionals could  
56 identify the signs of trauma underlying the patient's presentation [6, 7]. Additionally,  
57 women with a lifetime experience of violence were more likely to have consulted a  
58 healthcare provider within the previous four weeks due to illness [6, 7]. Furthermore,  
59 they are more than twice as likely to have been hospitalised within the previous 12  
60 months, and are more than two and a half times more likely to report current symptoms  
61 of emotional distress and suicidal thoughts in their lifetime, compared to woman who  
62 had not experienced violence [6, 7]. These findings have considerable implications for  
63 healthcare delivery, highlighting the need for specialist skills from health professionals  
64 who possess expertise in providing trauma-informed, evidence-based, medically and  
65 legally sound care and treatment [8, 9, 10]. These health professionals must also be able  
66 to appropriately identify current and past victims of violence within the health sector.

## 67 **Background**

68 When an emergency nurse provides care to victims of violent events, that nurse is  
69 providing forensic nursing care. Forensic nursing in the emergency department is a  
70 nursing specialty that focuses on the identification of patients whose illness, injury or  
71 death stems from acts of violence [8, 9, 10]. It involves not only providing life-saving  
72 management, resuscitation, and health care, which is the primary focus of the

73 emergency nurse [11, 12] , but also provide the best medical and legal care, through  
74 effectively identifying, collecting, documenting and preserving evidence, that can be  
75 handed over to law enforcement authorities, to be used in the investigation and  
76 prosecution of a case [8,9,10]. It is imperative therefore that emergency nurses are  
77 competent and feel confident to provide forensic care to ensure the patient’s medical  
78 and legal rights and needs are being met. This point was emphasised by Butchart and  
79 Mikton (2014) in the World Health Organisation report [2] on violence prevention,  
80 which recommends the need for forensically trained personnel in healthcare. The report  
81 states “*National health systems as a whole need to address violence by providing high-*  
82 *quality care and services that are timely, effective, sensitive to the needs of victims and*  
83 *their safety, and provided by well-trained professionals.*”

84

85 Lynch (1997) [13] and Hinderliter, Doughty, Delaney, Pitula and Campbell (2003) [14]  
86 describe nurses as lacking knowledge and awareness of forensic issues and lacking  
87 competence and confidence in their ability to screen patients for violence. Multiple  
88 researchers across different countries, United States of America, Australia, New  
89 Zealand, Sweden, Turkey and Romania point to a lack of sufficient forensic education  
90 among emergency nurses [14-20]. In New Zealand this point is significant, since there  
91 are no nurses with forensic science qualifications working in emergency departments in  
92 New Zealand [19], nor is there any current tertiary postgraduate study for nurses in  
93 forensic science principles in New Zealand to date [21].

94

95 Another barrier to nurses screening patients for violence is the nurse's own experience  
96 of the issue. In New Zealand one in every four females is affected by violence within

97 the home [22], therefore the predominantly female nursing workforce is likely to  
98 include a significant number who are themselves victims of violence [23]. It is essential  
99 therefore, that the nursing profession take the guesswork out of forensic patient care for  
100 emergency department nurses to ensure appropriate and effective medical and legal  
101 interventions can occur. Therefore, the purpose of this study was to establish the level  
102 of forensic knowledge and skills currently known and used by nurses in emergency  
103 departments within New Zealand District Health Boards (DHB's). Then develop a  
104 postgraduate tertiary education course based on the needs and gaps identified.

## 105 **Methods**

### 106 *Design/approach*

107 A descriptive approach was chosen to capture emergency nurse's knowledge, skills and  
108 experiences in caring for patients who were the victims of violence. Content for the  
109 questionnaire was determined based on an extensive literature review through searches  
110 in CINAHL, MEDLINE, Ovid, EBSCOHost and ProQuest using the search parameter  
111 key terms of forensic nursing, evidence collection in the emergency department, and  
112 chain of custody. Forensic nursing and forensic evidence collection textbooks were also  
113 consulted when selecting content for the questionnaire [10, 18, 24, 25]. The study  
114 utilized a researcher-designed questionnaire aimed at assessing the forensic knowledge  
115 of nurses within the emergency department setting. The questionnaire included both  
116 quantitative and qualitative components and was developed to include forensic science  
117 nursing knowledge on; twenty-seven specific categories of forensic patients [28], (seven  
118 categories of which were dropped due to not being applicable to New Zealand), forensic  
119 evidence collection including documentation, legislation or legal processes [24, 25,] and  
120 the need for forensic science education. The questionnaire consisted of five

121 demographic questions and twenty questions about forensic nursing knowledge and  
122 practice. Nine of the twenty questions were open-ended questions asking questions such  
123 as “*How would you define forensic nursing?*” and “*Which of the patient types [from the*  
124 *20 categories] might you consider to be a forensic patient?*”. The remaining eleven  
125 questions were closed questions such as “*Do you believe you have enough forensic*  
126 *knowledge to address your patients’ needs?*” “*Is educational material describing how*  
127 *to handle forensic evidence available on your Department/Hospital?*”

128

129 Once the questionnaire was developed, experts in the field of forensic science reviewed  
130 the questionnaire and gave input on the content validity, comprehensiveness, and  
131 readability.

132

### 133 *Participants*

134 The questionnaire was distributed to nurses by advertising online through the New  
135 Zealand emergency nurses’ section and by emailing (n=13) charge nurses in each  
136 district health board (DHB) in New Zealand and asking them to disseminate the  
137 information about the research project to their current workforce. Nurses who wished to  
138 participate were then asked to complete an anonymous online questionnaire about their  
139 knowledge skills, thoughts and ideas in relations to caring for patients who were the  
140 victims of violence. Sixty-three registered nurses chose to participate in the research.  
141 The questionnaire was open for nurses to complete from April-June 2019 and took  
142 approximately 15 minutes to complete.

### 143 *Data Analysis*

144 A thematic approach [26] was used to analyse the open-ended descriptions to identify  
145 themes that can then be used to establish the level of forensic nursing knowledge and  
146 skills emergency nurses had, so that a tertiary education course could be  
147 developed. Closed questions and demographic data were analysed using SPSS version  
148 15 data analysis software (SPSS Inc, Chicago, IL). The method of percentage  
149 calculation was used for the evaluation of the data.

150

151 The thematic approach used six levels of analysis; familiarising yourself with the data,  
152 generating initial codes from the data, searching for themes, reviewing potential themes,  
153 defining and naming themes and producing the report [26].

154

#### 155 *Ethical considerations*

156 This study was carried out in strict accordance with the Royal Society of New Zealand's  
157 Code of Professional Standards and Ethics in Science, Technology, and Humanities and  
158 approved by Waikato Institute of Technology Human Ethics in Research Group  
159 (HERG) (Permit number WTLR172019).

160

#### 161 *Funding considerations*

162 This research did not receive any specific grant from funding agencies in the public,  
163 commercial, or not-for-profit sectors.

164

## 165 **Results**

166 As seen in **Table 1**, the range in ages of participants was from age 20–61 and over, with  
167 most of the nurses being over the age of 40, indicating an aging nursing workforce.

168 **Table 1** also showed that there were significantly more female participants than males,

169 with over 90% of participants being female. Most participants were from the Northland/  
170 Auckland and Waikato/BOP/Gisborne region, which was expected as this is where the  
171 majority of New Zealand's population live. In terms of years of experience, more than  
172 55% of nurses reported more than 15 years of clinical experience of which more than  
173 ten of those clinical years was in the emergency department. **Table 1** also demonstrated  
174 that 75% of nurses had postgraduate qualifications however, none of these postgraduate  
175 qualifications were in forensic science, rather they were in trauma and emergency  
176 medicine.

177

#### 178 *Forensic Science knowledge and evidence collection*

179 The participants were asked to define what they believed forensic science nursing was,  
180 and if they believed having updated forensic science knowledge was crucial for their  
181 role in the emergency department?

182 Five participants did not know how to define forensic nursing, stating "*Not sure or*  
183 *unknown*" with one participant stating that it is "*not part of our scope of ED nursing so*  
184 *not sure*". Fifty-eight participants defined in part what forensic nursing is. For  
185 example, participants stated it is "*involving a crime*", "*is investigative nursing*", "*is a*  
186 *crime scene nurse*". Other participants stated, "*Is having criminal knowledge around*  
187 *nursing*", "*is collecting and providing evidence for court proceedings*" or "*is caring*  
188 *for victims that are related to a criminal event.*" Only four participants clearly  
189 identified that forensic nursing related to both application of nursing knowledge and the  
190 scientific and legal processes around patient care relating to violence or trauma. For  
191 example, one participant wrote "*the application of the nursing process to public or*  
192 *legal proceedings, and the application of forensic health care in the scientific*



193 *investigation of trauma and/or death related to abuse, violence, criminal activity,*  
194 *liability, and accidents.”*

195

196 84% (n=53) of all participants felt that having forensic knowledge was important for  
197 their practice, indicating a need for increased forensic education, 11% (n=11) were not  
198 sure and only three participants felt it was not required.

199

200 Participants were then asked to identify all the forensic patients out of a list of 20  
201 patient types as shown in **Table 2**. Most of the nurses could correctly identify sexual  
202 assault, abuse of the disabled, elder abuse, a patient hit by defacto partner, firearm  
203 injuries, and patients of catastrophic, mass destruction as forensic cases. On the other  
204 hand, only 31.7 % were able to correctly identify suicide attempt, 41.2% were able to  
205 correctly identify dog bites to a patient and 47.6 % of the health care staff were able to  
206 correctly identify transcultural female circumcision as a forensic case.

207

208 Participants were also asked to select the best answer out of a list of 15 different  
209 evidence items on how these items should be collected. As **Figure 1** demonstrates 52%  
210 (n=33) of participants and 69.8% (n=44) of participants incorrectly identified how to  
211 store items of clothing or damp jeans respectively while only 47% (n=30) and 28%  
212 (n=18) of participants correctly identified that each item of clothing and damp jeans  
213 goes into a separate paper bag. **Figure 1** also demonstrates how nine and twelve  
214 participants can identify that grass and hair respectively should be correctly collected  
215 into either an envelope or specimen container. Rope can also be collected into either an  
216 envelope or a plastic specimen container. Only one participant identified that rope could

217 be collected into an envelope whereas 11 participants identified a plastic specimen  
218 container, all remaining participants incorrectly identified how to collect rope evidence  
219 as shown in **Figure 1**.  
220 Furthermore, **Figure 1** demonstrates alarmingly that 11 participants believed no action  
221 was required for any type of bite marks even though 53% (n=34) correctly identified  
222 that a swab should be used to collect evidence from bite marks. Moreover, one  
223 participant identified that no action was needed to collect saliva around a wound even  
224 though 90% (n=57) correctly identified that a swab should be used to collect saliva  
225 around a wound. These results indicate that nurses' level of knowledge in the collection  
226 of forensic evidence in practice is clearly insufficient.

#### 227 *Legislation and the law*

228 The research clearly demonstrated that the majority of nurses understood forensic  
229 knowledge related to legal reporting with 98% of all participants understanding that if a  
230 child has been sexual assaulted, or they believed were in danger of being harmed, they  
231 could report this to authorities regardless of the Privacy Act (1993)<sup>1</sup> or having a doctor  
232 supporting them. Furthermore, 85% of all participants also knew they could contact the  
233 authorities to report a woman they believed might be in danger of abuse upon discharge,  
234 but where the nurses forensic knowledge could be improved was around if a patient  
235 admitting to a crime or having illegal substances or weapons on them. Over 52 % or  
236 (n=32) participants did not know if the Privacy Act (1993)<sup>1</sup> would prevent them from  
237 being able to notify the police in either of these situations. In addition, 13 nurses said  
238 they did not know what to do if they found any illegal substances or weapons on a  
239 patient, indicating the nurses need for further knowledge and training.

240

241 The participants were then asked if they believed forensic science was important for  
242 their roles, with 95% or (n=60) believed having updated forensic science knowledge  
243 was important for their role in the department, furthermore, only three nurses believed  
244 that they had enough knowledge to practice safely and confidently with this patient  
245 group.

246

247 The participants were then asked who they believed was responsible to address a  
248 patient's forensic needs out of the following professionals; doctors, nurses, hospital  
249 administration, police, lawyers or the first person to attend the patient. 97% (n=61) of  
250 nurses recognised that it is a joint responsibility between nurses, doctors and the police.

251 This is significant because collaboration between health care and law enforcement  
252 personnel is essential to most effectively meeting the needs of patients of violence.

253

#### 254 *Forensic science education*

255 The nurses were asked if they had any educational material describing how to handle  
256 forensic evidence in their department, only six participants said there was educational  
257 material available with 53% (n=23) and 37% (n=23) saying they did not know or that  
258 there definitely was not. Furthermore, the nurses who said they did not know or there  
259 was no educational material available, discussed how they wanted specific guidelines  
260 and material that helped to guide their practice. *"I want to know exactly what is*  
261 *collected and how to collect it, how to describe wounds and document correctly so that*  
262 *it can be presented in court. I want to know where to store evidence and who takes*  
263 *charge of it until the police collect it especially if the unit is busy and we have lots of*  
264 *patients."*

265 Another stated, *“I want to know can wounds be photographed legally before we do*  
266 *dressings and I need clarification/guidance around the law regarding what we can and*  
267 *cannot report to authorities.”*

268

269 Additionally, the participants were asked what areas if any they wanted more forensic  
270 education and training in. **Table 3** details the responses from the participants, with the  
271 areas they felt they needed or required education on. Some of the nurses gave written  
272 responses asking for education around the law and nurses legal responsibilities around  
273 reporting especially around what is and is not mandatory and how that relates to with or  
274 without patient consent. *“I want to know what our responsibilities are around*  
275 *reporting to authorities without patient consent and what we have to legally report on*  
276 *regardless of consent”*.

277

278 The nurses also asked for training around photographing evidence including what to  
279 document, and how to document in a non-judgemental way. The nurses also asked for  
280 how to write court reports and to give court testimony especially around what can  
281 nurses be required to do or say including coronial court.

282

283 These findings clearly show that nurses are asking for implementation of clear forensic  
284 guidelines to follow and to be provided with forensic science education and training to  
285 enable them to facilitate better support and care for patients who have been the victim of  
286 violence.

287

288 **Discussion**

289 As forensic patients may require emergency medical attention, it is important that  
290 nurses, as part of the front-line first responders, have forensic knowledge around  
291 preservation and collection of evidence during the provision of medical care to enable  
292 legal processes to occur. However, there are no nurses with forensic science  
293 qualifications working in emergency departments in New Zealand [19], where it is now  
294 a growing nursing specialty in many other countries around the world [18, 27]. Nor is  
295 there any current tertiary training or in-service for nurses in forensic science principles  
296 in New Zealand [21]. This research has highlighted the shortcomings of this lack of  
297 education and the importance of this research to demonstrate the level of forensic  
298 knowledge and skills emergency nurses working in New Zealand DHB's have, and  
299 therefore, what education is required to enable nurses to practice with forensic patients  
300 confidently and safely and to ensure medicolegal justice is being met.

301

302 This study demonstrated that although New Zealand nurses were able to partially define  
303 the role of a forensic nurse and to identify some patients who are forensic cases, over  
304 half the participants could not recognise that suicide attempt, dog bites to a patient or  
305 transcultural female circumcision as a potential forensic case. This suggests that  
306 patients with a variety of forensic-related issues, may not be adequately treated to  
307 pursue justice because of inadequate knowledge by nursing professionals. Additionally,  
308 forensic aspects of patient care are not always apparent when a patient first arrives at the  
309 emergency department. Initial information provided to nurses may (knowingly or  
310 unknowingly) be missing and can have a significant impact on whether an individual  
311 will be capable of successfully pursuing justice [22, 27]. For example, if a nurse cannot  
312 accurately identify and assess that a patient has specific forensic needs, essential

313 interventions such as the collection and preservation of forensic evidence may be  
314 missed. This study has shown that the nurse's knowledge around evidence preservation  
315 is clearly lacking with over 52% of nurses not able to correctly preserve patient  
316 clothing, grass, rope or hair samples. Furthermore, one participant believed no action  
317 was required for the collection of saliva around a wound, and 11 participants believed  
318 no action was required for bite marks. This study's findings are not out of keeping with  
319 current research [15, 16, 23,] which also shows that emergency nurses are aware of  
320 forensic patients in their departments, but they lack the knowledge, training or  
321 confidence to adequately care for this population group.

322

323 This study demonstrated that although 84% of nurses acknowledged the importance of  
324 applying forensic principles in practice, and 97% recognised that law enforcement is not  
325 solely responsible for collecting evidence, nurses have a significant impact on the legal  
326 outcome of forensic cases, supporting the need for forensic science nursing education.

327

328 Sadler (2002) and Rahmqvist, Benein and Erlington (2018) describe how health  
329 professionals who work in emergency or acute care are more likely to find forensic or  
330 legal situations a cause of considerable uncertainty and anxiety [29,16]. This is certainly  
331 true in the New Zealand context where 52 % (n=32) participants did not know if the  
332 Privacy Act (1993)<sup>1</sup> prevents them from being able to notify the police if a patient  
333 admits to a crime or has illegal substances or weapons on them. These nurses also  
334 mentioned how they hoped hospital guidelines or policy could be developed to help  
335 guide their practice, indicating their potential uncertainty around forensic practice and  
336 the lack of resources currently available to help nurses with these decisions. These

337 findings also support research by Fanslow, Norton, Robinson and Spinola, (1998) who  
338 describe how New Zealand health care professionals are concerned with addressing the  
339 issue of violence and crime due to fear of ‘opening Pandora’s box’, fear of offending, a  
340 sense of powerlessness, time constraints and issues associated with privacy [30].

341

342 The current study showed that 95% (n=60) participants wanted more education and  
343 training around evidence collection, documentation and forensic patient identification as  
344 well as, the law and the court process, indicating that the nurses were well aware of their  
345 knowledge shortfall and wanted to address these deficits.

346

347 Shapiro (2011) states that when emergency nurses are educated about, basic evidence  
348 collection, the practice can become an automatic and integral part of patient care that  
349 does not delay treatment, emphasizing the need for forensic science training for  
350 emergency nurses [31]. Sullivan (2005) also describes the importance of evidence  
351 recognition, collection and accurate documentation, where she points out this is a means  
352 to an end for giving patients who are victims of violence, true holistic care [12].

353 Unfamiliarity, inexperience, and knowledge deficits about whom and what forensic  
354 patient care involves, contributes to nurses experiencing anxiety regarding their  
355 professional roles and responsibilities and can be seen from the patients view point as  
356 disinterest, insensitive and uncaring [14], with previous studies showing perceived  
357 uncaring encounters can leave victims of violence feeling retraumatized and create more  
358 suffering [32, 33]. Furthermore, if education is inadequate, the assessment and  
359 priorities of care may outweigh the importance of recognizing, documenting and

360 collecting evidence. Therefore, if important evidence is destroyed and/or overlooked, a  
361 serious legal injustice could be rendered to the patient whether victim or suspect.

## 362 **Conclusion**

363 Forensic clinical nursing does not yet exist in New Zealand. Due to patients visiting the  
364 emergency departments as victim or perpetrator of violence, and the health  
365 consequences of violence having significant long-term consequences, it is important  
366 that front-line emergency nursing staff can meet the holistic needs of this group of  
367 patients. Therefore, it is imperative that forensic educational training and knowledge as  
368 well as departmental and organisational guidelines are developed to support the New  
369 Zealand emergency nurse to address not just the health care of these patients but their  
370 legal needs also.

371

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486

487 **Footnote 1-** The Privacy Act controls how 'agencies' collect, use, disclose, store  
488 and give access to 'personal information'. Almost every person or organisation that  
489 holds personal information is an 'agency' in accordance to this act. The Privacy Act  
490 consists of twelve privacy principles. The privacy principles cover: collection of  
491 personal information (principles 1-4) storage and security of personal information  
492 (principle 5) requests for access to and correction of personal information  
493 (principles 6 and 7, plus parts 4 and 5 of the Act) accuracy of personal information  
494 (principle 8) retention of personal information (principle 9) use and disclosure of  
495 personal information (principles 10 and 11), and using unique identifiers (principle  
496 12).

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498

499 **Figure Legends-** These are written in the order that they appear in the manuscript.

500 **Table 1-** Demographic Characteristics of participants (n=63)

501 **Figure 1-Collection and preservation of evidence.** How participants chose to store  
502 different items of physical evidence is shown.

503 **Table 2-** Patient types and the number of participants who identified each type.

504 **Table 3-** Education topics identified by participants as needed.

505