



Documentation of wounds in emergency departments through a forensic lens

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ABSTRACT

Background: Nurses document wounds to direct and evaluate the care. People admitted to emergency departments with wounds should be regarded as potential forensic patients, requiring meticulous documentation for evidence purposes.

Aim: To explore the documentation of wounds in emergency departments through a forensic lens and compare it between different levels of emergency departments.

Methods: In this descriptive retrospective study, we randomly sampled 515 paper-based medical files of patients who sustained wounds admitted to three selected emergency departments. The files were analysed using a structured data collection tool the data were descriptively analysed.

Results: All files included information on the type of wound (100%) and the site of the wound (100%) with most files including the mechanisms of injury (98.6%). Few files included information on blood loss (18.1%) and the size of the wound (15%). Only one file included information on the contents of the wound. No files included information on the wound's shape and the surrounding skin's condition.

Conclusion: Wounds were poorly documented in emergency departments, irrespective of the level of care. Nurses in emergency departments should have strict guidelines for documenting wounds since accurate documentation protects patients' human rights and protects nurses.

1. Introduction

All patients in the emergency department are forensic patients until otherwise proven as their conditions or injuries can potentially interact with legal processes [1]. Patients with wounds and injuries has a high probability of litigation especially if the mechanism of injury includes assault, abuse and neglect, firearm and transportation injuries, occupation-related injuries, gang violence and terrorism [2]. Injured patients generally seek care in EDs.

Nurses are the first healthcare providers to come into contact with patients and the first to assess the situation, the patient and the wound or injury before medical interventions that can alter the appearance and potentially contaminate evidence [1]. Nurses in the ED therefore, have the unique opportunity to record wounds and injuries as it presents on admission and document any evidence that may dissipate over time such as smell, moisture and imprints also referred to as transient evidence [3]. Accurate record keeping directs care and serve as a baseline for evaluating care regardless of the causes of injuries and is a

communication tool among healthcare professionals [4,5,6]. In cases of possible litigation, patient records may serve as evidence to corroborate or contradict versions of events. Accurate record keeping could be argued as a form of advocacy to protect patients' rights to justice.

Nursing care are directed by the nursing process and have all heard the saying "if it is not written it was not done". The quality of documentation and record keeping by nurses have unfortunately been found wanting potentially positioning patients and nurses in harm's way [7]. Nurses often regard documentation and record keeping as a tedious time-consuming activity even though it is essential for safe, quality patient care. In addition, standards and norms for what exactly to document are sparse with the lack of uniform terminology indicated as a barrier [8].

Accurate documentation and record keeping becomes more pronounced in the litigation of medico-legal cases, which may drag out for months or years [9]. In the case where patients present with injuries it is advisable to use unambiguous language for the description of the wound and supplement the description with body diagrams and if possible

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photographs [10]. As there a limited time spend on wound description during the education of nurses and doctors they will have inadequate skills to accurately classify the types of wounds [11]. However, when injuries are described in terms of mechanism of injury, site, size, shape, surroundings skin, blood loss and contexts of the wound, healthcare professionals, forensic experts and lawyers may be able to make conclusions regarding the circumstances surrounding the injury as well as care provided and progression of healing [10,11].

Clinical records of patients are used as a source of evidence during all litigation processes making documentation and record keeping an essential competency for nurses [12]. Regardless of the origins of a patient's injuries, the causes of wound or injuries should be meticulously described to inform other healthcare professionals and support best practice to improve the quality of care [13]. Nurses should accurately document patient information to develop and implement appropriate treatment plans, monitor changes in patient condition and ensure continuity of care [14]. For forensic patients, inadequate documentation and records could hamper their cases as they go through the criminal justice system [15,16]. Therefore, the purpose of this article is to report on the documentation of wounds in emergency departments through a forensic lens and compare the documentation between different levels of emergency departments.

2. Methods

This descriptive retrospective study explored how injuries are documented in EDs. The research commenced after approval from the University XXX, Faculty of Health Research Ethics Committee (120/2018).

We examined patient records from three randomly selected EDs from the same Private Healthcare institution using the uniform document templates, policies and procedures in Gauteng, South Africa. The Trauma Society of South Africa accredits EDs as level 1, level 2 and level 3 EDs. Level 1 EDs provide high levels of service, are affiliated with universities and training hospitals, and engage in research and provide leadership to level 2 and 3 EDs [17]. Most injured patients are treated in level 2 EDs, they are obliged to care for injuries regardless of severity but can refer patients to level 1 EDs if needed and research is not often conducted in level 2 EDs [17]. In level 3 EDs, healthcare professionals assess, resuscitate and stabilise injured patients in communities without level 1 and level 2 hospitals. Patients in level 3 EDs can be transferred to level 1 or 2 EDs where they can access definitive care [17].

We analysed paper-based, medical records of patients who sustained wounds and sought care at the three selected EDs over the 7-month period from June 2018 to December 2018. We included all patients presenting with wounds or injuries that were older than 18 years. The following patients were excluded 1) critical patients with multiple and complicated injuries, 2) patients presenting with sexual assault, 3) burn wounds from open fires, chemicals or hot fluids with more than 10% total surface area, 4) psychiatric-related injuries, such as self-mutilation cuts and 5) follow-up patients who came back for a check-up or wound care. The sample size was calculated to include 100–150 patient files per ED (N = 500). We first explored the ED registers for patients that presented with wounds and then randomly selected every 5th patient until we reached a sample size of 515 patient records proportional to the number of patients seen at each ED.

2.1. Data collection

We collected data using a structured data collection tool developed from the literature pertaining to the forensic description of wounds [10,11]. The tool comprised three sections, namely, section A: demographic information, including patient gender and age, and category of the nurse who completed the documentation (3 items), section B: mechanism of injury comprised of blunt force (lacerations), penetrating (gunshots) and sharp injuries (cuts and stab wounds) (3 items) and

section C: description of injury in terms of site, size, shape, surrounding skin, blood loss and contents of the wound (6 items). We each pilot tested the data collection tool on five patient files, the data collection was consistent and no changes were required.

2.2. Data analysis

The data were summarised using descriptive statistics, including means and standard deviations (SD) for numerical data, and proportions and percentages for categorical data. We compared the proportions of recorded characteristics between the different ED levels, differences were deemed significant if $p < 0.05$. Inferential investigations included the Chi-square test for the comparison of mechanism of injury, size of the wound and blood loss,

3. Results

The 515 files comprised of 228 (44.3%) from the level 1 ED, 180 (35.0%) from the level 2 ED and 107 (20.7%) from the level 3 ED. The records included 132 (25.7%) women and 382 (74.3%) male patients. These patients had an average age (SD) of 38.5 (14.7) years, and their ages ranged from 18 to 88 years. Registered nurses completed 287 (55.7%) documents and 228 (44.3%) were completed by enrolled nurses.

The mechanism of injury was recorded in 508 (98.6%) files. The mechanism of injury described included wounds caused with knives, glass, metal sheets, tools and machinery (n = 196, 38.6%), fall from heights (n = 114, 22.4%), crush injuries caused by machinery, tools, furniture, doors and gates (n = 90, 17.7%), assaults (n = 38, 7.5%), dog bites (n = 14, 2.8%), motor vehicle accidents (n = 13, 2.6%), sport injuries (n = 11, 2.2%), bicycle accidents (n = 9, 1.8%), gun shots (n = 9, 1.8%), motor bike accidents (n = 6, 1.2%), stab wounds (n = 5, 1.1%), explosion air bag (n = 1, 0.2%), human bites (n = 1, 0.2%) and plane crash (n = 1, 0.2%). The type of injuries documented included lacerations (n = 470, 91.3%), open wounds (n = 17, 3.3%), dog bite (n = 12, 2.3%), penetrating gunshots (n = 9, 1.7%), sharp stab wounds (n = 5, 1.1%), human bite (n = 1, 0.2%) and sharp cuts (n = 1, 0.2%).

The site of injury was reported as upper limbs (n = 219, 42.5%), head (n = 188, 36.5%), lower limbs (n = 97, 18.8%), back (n = 3, 0.6%), buttocks (n = 2, 0.4%) and chest front (n = 2, 0.4%), neck (n = 2, 0.4%), abdomen (n = 1, 0.2%) and pelvis (n = 1, 0.2%).

Further description of wounds included the site of the wound (n = 515; 100%), the size of the wound (n = 77; 15%) and blood loss (n = 93; 18.1%) (Table 1).

We also compared how wounds were described in the different levels of EDs (Table 2). Descriptions did not differ significantly between the different levels of EDs.

4. Discussion

In this study, we explored how nurses documented wounds in EDs in Gauteng, South Africa.

All the patient files in the sample provided a description on the mechanism of injury with n = 196 (38.6%) caused by knives, glass,

Table 1
Summary of variables used to describe wounds in medical records (N = 515) sampled from emergency departments in Gauteng, South Africa.

Description variable	Frequency Count (%)
Site	515 (100)
Size	77 (15)
Shape	0 (0)
Surrounding skin	0 (0)
Blood loss	93 (18.1)
Contents in wound	1 (0.2)

Table 2

Summary of the documentation of injury variables in different level EDs in Gauteng, South Africa.

Variables documented	Level 1	Level 2	Level 3	P-values
	(N = 228) Count (%)	(N = 180) Count (%)	(N = 107) Count (%)	
Mechanism of injury	224 (98.2)	177 (98.3)	107 (100)	0.49
Type of injury	228 (100)	180 (100)	107 (100)	
Size of wound	32 (14)	29 (16.1)	16 (15)	0.84
Site of wound	228 (100)	180 (100)	107 (100)	
Shape of wound	0 (0)	0 (0)	0 (0)	
Surrounding skin	0 (0)	0 (0)	0 (0)	
Blood loss	32 (14)	40 (22.2)	21 (19.6)	0.09
Contents in wound	0 (0)	0 (0)	1 (0.1)	

metal sheets, tools and machinery. The site of the wounds was recorded but few descriptions of wounds and injuries communicated the size, blood loss and contents of the wound. None of the records contained any information on the shape of the wound or the conditions of the surrounding skin. The most common type of injury recorded was lacerations ($n = 470$, 91.3%).

The mechanism of injury is required to judge the severity of the injury and guide healthcare professionals to search for potential occult injuries [18]. The mechanism of injury provides information on the direction, force and if applicable the ‘weapon’ used to inflict the wound or injury. High-velocity injuries caused by firearms can cause penetrating wounds, sharp objects such as glass and knives cause cuts and stab wounds, and blunt force injuries produces wounds and injuries such as abrasions, contusions, lacerations and fractures [11,19,20].

The data revealed that most medical records described wounds as lacerations, which corresponds with previous studies [21,22,23]. Lacerations are caused by impact from blunt force, resulting in an irregular wound surrounded by torn skin accompanied by various signs of surrounding injury [18]. We noted that some of the lacerations ($n = 470$, 91.3%) may have been described incorrectly as only $n = 188$ (36.5%) of the injuries were caused by blunt force. Incorrect descriptions of a wound may distort the picture of the actual injury, which may influence how healthcare professionals interpret the mechanism, force or intent behind injuries. In addition, training is needed for healthcare professionals in the ED to enhance more accurate assessment of wounds with a focus on the correct identification of the type of wound to corroborate the stated fact that lacerations are the most common injury managed in ED's [24].

Additionally, we compared how injuries were documented in different levels of EDs. We assumed that based on the accreditation criteria for the different levels of EDs that level 1 EDs would be more proficient in documentation and record keeping. Injuries were however, documented similarly in the different levels of EDs, which reflects a limited awareness and knowledge regarding the requirements for describing injuries. Accurate record-keeping is essential in EDs, especially if every patient is viewed as a potential forensic patient [1].

Medical records should contain and preserve rich information so that it can be used in litigation long after wounds have healed and patients have forgotten the trauma [12]. Globally, there are concerns about the overall quality of nurses' records, whether paper-based or electronic [25,26]. Paper-based records, in particular, suffer from a lack of process and structure [13], while electronic records are known to be data-rich but information-poor [26]. Inaccurate documentation and record keeping influences the whole health system and can have high cost implications in the form of litigation pay-outs. Record keeping is not just important for forensic patients involved in a criminal justice process but also provides a safety net for nurses that provides evidence on the care and interventions delivered to patients [27]. Accurate documentation and record keeping is however, not an easy task and must be adhere to with due diligence.

It is important to mention that identifying and describing wounds is

challenging. In our study, most medical records described the site of the injury, with little extra information (Table 1). Other studies have also reported that wounds are inadequately described [25,23]. Several authors have recommended that wounds should be meticulously recorded with diagrams and photographs [6,11]. None of the records in our study included diagrams or photographs. The taking photographs should fall within each country's laws and hospital policies but could provide valuable information and clues in all patients presenting to the ED with wounds [11].

Nurses should also be empowered to describe the mechanisms of injuries and be able to differentiate between self-inflicted and unintentional wounds versus attacks or intentional injury [(Viero et al., 2019). In addition document protocols could be set up to guide nurses in describing wounds in terms of site, size, shape, condition of surrounding skin, content and blood loss [15].

5. Strengths and limitations

The study was done in three different levels of EDs from the same hospital group, with similar documentation and policies. The data was collected by only one of the authors enhancing the consistency of data collected. The inclusion of all patient with injuries into the sample regardless of the circumstances surrounding the injury provided an overview of how wounds described in general as nurses often change their practices when litigation is expected. The data was collected in 2018 however there is no evidence that the situation has improved. In addition, due to the retrospective nature of the study, we could not explore the influence of the environment and workload on documentation. The absence of characteristics in medical records, such as site and surrounding skin, prevented statistical analysis of these variables. We declare that the data collection instrument has not been formally validated and only pilot tested by the authors.

6. Conclusion

This study highlights poor documentation of wounds in EDs, regardless of the level of care. Nurses more frequently documented the type of wounds than the mechanism of injuries. Limited information regarding the size of the wound, blood loss and mechanism of injury were found. Nurses neglected to document the shape, condition of surrounding skin and contents of the wound. We suggest that nurses undergo continuous professional development on the documentation of wounds in EDs. Emergency departments could develop innovations, to assist nurses to document wounds appropriately. Documentation of injuries in EDs should be prioritized, since accurate records protects patients' rights and protects nurses from medico-legal litigation.

CRedit authorship contribution statement

Celia J. Filmlalter: Conceptualization, Data curation, Formal analysis, Methodology, Resources, Writing - original draft, Writing - review & editing. **Tanita Botha:** Formal analysis, Methodology, Writing - review & editing. **Tanya Heyns:** Supervision, Validation, Writing - original draft, Writing - review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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References

- [1] Lynch V. Forensic nursing science: global strategies in health and justice. *Egypt J Forensic Sci* 2011;1(2):69–76. <https://doi.org/10.1016/j.ejfs.2011.04.001>.
- [2] Pasqualone G, Michel C. Forensic patients hiding in full view. *Crit Care Nurs Q* 2015;38(1):3–16. <https://doi.org/10.1097/cnq.0000000000000043>.
- [3] Saferstein R. Principles of forensic evidence collection and preservation. <https://nursekey.com/6-principles-of-forensic-evidence-collection-and-preservation/>; 2016.
- [4] Akhu-Zaheya L, Al-Maaitah R, Bany Hani S. Quality of nursing documentation: paper-based health records versus electronic-based health records. *J Clin Nurs* 2018;27(3–4):e578–89. <https://doi.org/10.1111/jocn.14097>.
- [5] Coffey C, Wurster LA, Groner J, Hoffman J, Hendren V, Nuss K, et al. A comparison of paper documentation to electronic documentation for trauma resuscitations at a level I pediatric trauma center. *J Emerg Nurs* 2015;41(1):52–6. <https://doi.org/10.1016/j.jen.2014.04.010>.
- [6] Herath JC, Pollanen MS. Clinical examination and reporting of a victim of torture. *Acad Forensic Pathol* 2017;7(3):330–9. <https://doi.org/10.23907/2017.030>.
- [7] Tajabadi A, Ahmadi F, Sadooghi Asl A, Vaismoradi M. Unsafe nursing documentation: a qualitative content analysis. *Nurs Ethics* 2020;27(5):1213–24.
- [8] De Groot K, Triemstra M, Paans W, Francke AL. Quality criteria, instruments, and requirements for nursing documentation: a systematic review of systematic reviews. *J Adv Nurs* 2019;75(7):1379–93.
- [9] Lynch V, Duval J. *Forensic nursing science*. Elsevier Health Sciences 2010.
- [10] Stark M. *Clinical forensic medicine*. 4 ed. Springer Cham; 2020.
- [11] Amar A, Sekula LK. *A practical guide to forensic nursing: Incorporating forensic principles into nursing practice*. USA: Sigma Theta Tau International; 2016.
- [12] Rosen JR, Suresh S, Saladino RA. Quality care and patient safety in the pediatric emergency department. *Pediatr Clin North Am* 2016;63(2):269–82. <https://doi.org/10.1016/j.pcl.2015.12.004>.
- [13] Beach J, Oates J. Maintaining best practice in record-keeping and documentation. *Nurs Stand* 2014;28(36):45–50.
- [14] Fouché L, Bezuidenhout J, Liebenberg C, Adefuye A. Practice of community-service doctors in the assessment and medico-legal documentation of common physical assault cases. *S Afr Fam Pract* 2018;60(1). <https://doi.org/10.4102/safp.v60i1.4845>.
- [15] Kjærulff MLBG, Bonde U, Astrup BS. The significance of the forensic clinical examination on the judicial assessment of rape complaints – developments and trends. *Forensic Sci Int* 2019;297:90–9. <https://doi.org/10.1016/j.forsciint.2019.01.031>.
- [16] Hardcastle T, Steyn E, Boffard K, Goosen J, Toubkin M, Loubser A, et al. Guideline for the assessment of trauma centres for South Africa. *S Afr Med J* 2011;101(3):189–94. <https://doi.org/10.10520/EJC67528>.
- [17] Fadl SA, Sandstrom CK. Pattern recognition: a mechanism-based approach to injury detection after motor vehicle collisions. *Radiographics* 2019;39(3):857–76. <https://doi.org/10.1148/rg.2019180063>.
- [18] Cohen H, Sarie I, Medlej B, Bocquentin F, Toledano T, Hershkovitz I, et al. Trauma to the skull: a historical perspective from the southern Levant. *Int J Osteoarchaeol* 2014;24(6):722–36. <https://doi.org/10.1002/oa.2258>.
- [19] Joyner K. *Aspects of forensic medicine: an introduction for healthcare professionals*. Juta and Company Ltd.; 2010.
- [20] Chico-Fernández M, Llompарт-Pou J, Guerrero-López F, Sánchez-Casado M, García-Sáez I, Mayor-García M, et al. Epidemiology of severe trauma in Spain. Registry of trauma in the ICU (RETRAUCI). Pilot phase. *Med Intensiva* 2016;40(6):327–47. <https://doi.org/10.1016/j.medic.2015.07.003>.
- [21] Kamol C, Akunga D, Warutere P. Occurrence of occupational physical injuries among workers in onshore oil drilling operations in Turkana county. *Kenya Health Sci J* 2019;13(1). <https://doi.org/10.21767/1791-809X.1000619>.
- [22] Loots DP, Saayman G. Medicolegal perspectives of interpersonal violence: a review of first-contact clinical notes. *S Afr Med J* 2019;109(10):792–800. <https://doi.org/10.7196/SAMJ.2019.v109i10.13951>.
- [23] Otterness K, Singer AJ. Updates in emergency department laceration management. *Clin Exp Emerg Med* 2019;6(2):97.
- [24] Cornock M. Record keeping and documentation: a legal perspective. *Orthopaed Trauma Times* 2019;35:34–8.
- [25] Eichler HG, Bloechl-Daum B, Broich K, Kyrle PA, Oderkirk J, Rasi G, et al. Data rich, information poor: can we use electronic health records to create a learning healthcare system for pharmaceuticals? *Clin Pharmacol Ther* 2019;105(4):912–22. <https://doi.org/10.1002/cpt.1226>.
- [26] Watrelot AA, Tanos V, Grimbizis G, Saridogan E, Campo R, Wattiez A. From complication to litigation: the importance of non-technical skills in the management of complications. *Facts, Views Vis ObGyn* 2020;12(2):133.
- [27] Viero A, Amadasi A, Blandino A, Kustermann A, Montisci M, Cattaneo C. Skin lesions and traditional folk practices: a medico-legal perspective. *Forensic Sci Med Pathol* 2019;15(4):580–90. <https://doi.org/10.1007/s12024-019-00115-4>.