

The knowledge, skills and attitudes of prehospital emergency care providers
with regard to infant abuse in South Africa and the development of an
educational intervention

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DECLARATION

I, Kayleigh Lachenicht, declare that this thesis is my own, unaided work. It is being submitted for the degree of Master of Science in Medicine (Health Science Education) at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at this or any other university.

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Date:

ABSTRACT

Infant abuse is a poorly recognised problem in the prehospital setting. Much work has been done in the international setting describing the problems associated with assessment and recognition of the infant patient who has been physically abused. In South Africa there is very little information on the knowledge, skills and understanding of prehospital emergency care providers about infant abuse, and less information available about how the problem of assessing, recognising and reporting of infant abuse can be taught. A needs analysis of the knowledge, skills and attitudes was conducted, with the intention to create an online educational intervention to effect change in the knowledge, skills and attitudes of emergency care providers when dealing with infant abuse.

The study enrolled 71 respondents, who answered questions and case studies related to infant abuse in an online questionnaire. Data were analysed descriptively, using *Statistica (version 12)* and a learning intervention was created to meet the knowledge and skills gaps identified. The intervention was created with the intention of addressing attitudes of the respondents through engagement in case studies in an attempt to illicit emotional responses to change the way prehospital emergency care providers interact with and deal with the abuse of the infant patient.

Trends that were identified in the study were difficulty in assessing infants, recognising abuse consistently across different cases, and applying the laws to reporting these cases. Respondents were inconsistent in the application of the legal requirements and were often unsure of the specific red flags that should be recognised. More research should be conducted to determine whether an online intervention is a viable tool to effect change in knowledge, skills and attitudes towards infant abuse in the prehospital care.

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CHAPTER 1 – INTRODUCTION

1.1 Background

Infant abuse is a problem in South Africa, with reports of infants being injured by parents or other adults in their lives on a frequent basis. With infant abuse becoming more prevalent, and more of these patients presenting to the prehospital emergency care providers, these providers need to be able to recognise possible abuse and report suspicion of this abuse as required by South African law.

Abuse of the infant and child is a global problem (Akmatov, 2011). Mortality in children <5 years of age has been identified as a global issue, resulting in the development of the United Nations Millennium Development Goal to reduce childhood mortality by 2015 (United Nations, 2015). European studies report an annual figure of 200 cases of “shaken baby syndrome” with a mortality rate of between 30% and 70% (Matschke, Herrmann, Sperhake, Körber, Bajanowski and Glatzel, 2009). Similar statistics are reported in the United States with reports of 510 children deceased due to abuse and neglect in a ten-year period (2001-2010), and 25% of admissions for head injuries being due to suspected abuse (Dakil, Cox, Lin and Flores, 2012).

In South Africa, child abuse is a problem, with the most common cause of death in infants who suffered trauma being due to homicide (Nannan, Dorrington, Laubscher, Zinyakatira, Prinsloo, Darikwa, Matzopoulos and Bradshaw, 2012), and the fourth most common cause of death in the child one to four years of age (Nannan et al, 2012). Abuse in any form must be reported by anyone in contact with children; this includes the prehospital care provider (Children’s Act 38, 2005. Section 110). Due to the paucity of information on the infant in an abusive situation, reference will be made to existing studies that detail information regarding both children and infants.

Infant abuse is poorly reported at all levels of the healthcare system, with reports suggesting that as many as 40% of mandated professionals have failed to report a suspicion of abuse at some time in their careers (Alvarez, Kenny, Donohue and Caprin,

2004). Internationally reports suggest that despite the fact that possible abuse was suspected and documented, it was not reported to the correct authorities in over 50% of cases of deceased children (Lynne, Glifford, Evans and Rosch, 2015). A South African study conducted in 2015 reported that prehospital emergency care providers may not know to whom to report the suspicion of abuse (Dessena, Wallis and Twomey, 2015). Prehospital emergency care providers in numerous international studies were uncertain of the diagnosis (Talsma, Bengtsson Boström and Östberg, 2016; Regnaut, Jeu-Steenhouwer, Manaouil and Gignon, 2015) and were unsure of their role as “mandatory reporters” (Markenson, Tunik, Cooper, Olson and Cook, 2002). In South Africa, prehospital emergency care providers are required to report any suspicion of child abuse in line with Section 110(1) of the Children’s Act of 2005 of South Africa.

Infant abuse is difficult to recognise and is commonly not recognised in the initial assessment. This is a historical problem that was identified as far back as 1986 in a British paper which stated that approximately 50% of the children who are reported as abused had been examined by a medical provider on a previous visit, and not recognised as a potential abuse victim (Worlock, Stower and Barbor, 1986). A more recent American publication suggests this figure may be as high as 73% (Flaherty, Sege, Griffith, Price, Wasserman, Niramol, Harris, Norton, Lu Angelilli, and Binns, 2008).

Unless the infant is obviously injured, prehospital emergency care providers may not have a suspicion of abuse (Markenson et al., 2002). This may be because the curricula taught to prehospital care providers focuses on the severely injured patient, and not on the more subtle signs that might be required to diagnose abuse early (Jackson, Kissoon & Greene, 2015).

Infants who have been abused commonly present with symptoms that are non-distinct from other common medical emergencies, for example seizures, (Rocourt and Nwomeh, 2011) respiratory distress (Herendeen, 2002), unconsciousness or episodes of apnoea (Kemp, Stoodley, Coble, Coles and Kemp. 2003). Histories and information reported by caregivers in the case of the abused infant are often vague and non-specific (Herendeen, 2002) making interpretation of the presenting problem a challenge. In a South African study, up to 27% of children presenting with signs of severe abuse had been seen by

child protective services before (Jackson, Kissoon & Greene, 2015), highlighting the fact that these infants are not recognised on initial presentation.

By the time the infant presents to the prehospital care provider, the injury may be too severe to hide (Duhaime et al., 1998). Infants are at high risk for abuse, which was reported by Warman in the United States as far back as 1984. The younger the child; the higher the risk of abuse (Ffion, Davies, Coats, Fisher, Lawrence, Lecky, 2015) with children under the age of three being at a higher risk of death from abuse (Rocourt & Nwomeh, 2011). The brain of the infant is at higher risk of trauma for a variety of reasons, namely the weakness of the neck muscles and thereby control of the larger head and decreased levels of myelination and the thin friable central nervous system vasculature (Rocourt & Nwomeh, 2011).

All children are at risk for abuse (Jackson, Kissoon & Greene, 2015), however there are a number of recognised family, history and clinical factors which place certain infants at higher risk for possible abuse (Jackson, Kissoon & Greene, 2015)

These risks are identified throughout the international literature, and include but are not limited to:

- Younger mothers (Sanders & Cobley., 2005; Matschke et al., 2009);
- Sick infants for example colicky babies and infants with disability (Matschke et al., 2009);
- Parents who use alcohol or drugs (Sanders & Cobley, 2005; Richter and Dawes, 2008; Matschke et al., 2009);
- Poverty or low socio-economic status (Richter & Dawes, 2008; Matschke et al., 2009).

Prehospital emergency care providers are uniquely poised to recognise abuse of the infant, as they are the only providers invited into the homes and scenes where abuse may be taking place (Markenson et al., 2002). It is important that these providers have the appropriate training to enable them to recognise, report and intervene in these cases (Markenson et al., 2007). There is insufficient emphasis on the role of prehospital emergency care providers in the recognition and reporting of abuse (Lynne et al., 2015);

more training is needed in the field. In a similar study 78% of respondents requested extra learning opportunities in the field (Markenson et al., 2007). Diagnosis of abuse in the infant population is often based on subjective opinion, experience and “gut feel” (Sanders and Cobley, 2005) and not on knowledge and assessment of risk factors. There is a paucity of information regarding the early recognition of abuse in the infant population, and even less information regarding the role of the prehospital emergency care provider in the recognition of abuse, although it has been reported that early recognition of abuse is the best way to reduce mortality (Jackson et al., 2015).

1.2 Problem statement

It is well documented that abuse towards the infant is a problem, both globally and in South Africa with the prehospital emergency care provider often the first point of contact for these abused infants. Prehospital emergency care providers may not be adequately equipped to recognise possible abuse in the prehospital environment and may be unaware of their roles as mandated reporters. No literature could be found describing the knowledge, skills and attitudes of emergency care providers in relation to the recognition and reporting of infant abuse in the South African context. Based on the identified knowledge, skills and attitudes, what information should be included in an educational intervention?

1.3 Purpose of the study

The purpose of this study was to determine the current knowledge, skills and attitudes of the prehospital emergency care providers in South Africa with regard to the recognition and management of the infant patient who has been abused. Based on the needs identified, an education intervention was developed.

1.4 Research questions

1. Are prehospital emergency care providers able to recognise clinical signs and symptoms, and elements of the patient history that indicate abuse in the infant population?
2. Do these providers know what is required of them in terms of South African law for the reporting of suspected abuse in the infant population?

1.5 Research objectives

The objectives of the study were to:

- Establish whether the prehospital emergency care providers in South Africa can recognise signs of abuse and the need to report a suspicion of infant abuse in the prehospital environment.
- Determine whether years of experience and qualification level result in better knowledge, skills and attitudes in the recognition and reporting of child abuse in the prehospital environment.
- Develop an educational intervention to address the issues determined by the initial needs' analysis.

1.6 Operational definitions

For the purposes of this study the following definitions apply:

Child under 3

This is the group of children in whom recognition of abuse will be addressed and reported in this study, as this is the group of children who are at the highest risk for mortality (Barlow, 2012). These children have been termed “infants and toddlers” in the study for a uniform understanding of the age of these children.

Expert Group

Defined as the Shaken and Abused Baby Intervention Group (SAABI) at the Teddy Bear Clinic. This expert group is made up of representatives from each of the involved specialities that deal with the shaken baby cases. They meet monthly to discuss current ongoing cases in the social welfare and justice system and follow up on the neurodevelopmental status of the children in the system. This group deals exclusively with infant abuse and shaken baby cases.

Emergency Medical Services

Emergency Medical Services (EMS) refers to all prehospital emergency care providers

Prehospital Emergency Care Providers

Refers to people working within the prehospital environment, who are registered with the Health Professions Council of South Africa, as independent practitioners, this includes the following practitioners:

- Intermediate Life Support practitioners (these are emergency care providers who are registered on the ANA (Ambulance Emergency Assistant) register as independent practitioners)
- Advanced Life Support practitioners
 - ANT (Critical Care Paramedic) are prehospital care providers who have completed a six to twelve-month course after approximately 2000 hours of clinical time in the pre-hospital environment.

This register also represents those who have completed a two-year diploma in prehospital emergency medical care. It is important to note that although these two qualifications appear on the same register, they have different scopes of practice, but are both independent providers of emergency care, at an advanced life support level.

- ECP (Emergency Care Providers) are prehospital care providers who have completed a four-year degree in prehospital emergency medicine.
- ECT (Emergency Care Technicians) are prehospital care providers who have completed a two-year certificate. This is a qualification that is no longer offered in the country and was replaced by the two-year diploma. Those who have completed the new diploma now register on the ANT register (see the information under ANT registration).

Knowledge

Refers to the cognitive domain, meaning the ability of the respondent to recall theoretical facts and information that might lead to a diagnosis of abuse in the infant population.

This includes the knowledge regarding clinical and historical elements that might lead to a suspicion of abuse, and the knowledge of when a case of possible abuse should be reported

Skills

Skills refer to the ability to apply the knowledge referred to above.

Attitudes

Attitudes refers to the manner of thinking or feeling that reflects the state of mind of the respondent toward the recognition and reporting of infant abuse in the prehospital setting. It is recognised that attitudes are not static and can be affected over time, usually through experience.

1.7 Justification for the study

This research provides valuable information about the knowledge, skills and attitudes of South African prehospital emergency care providers, on infant abuse in the South African context. There is very little information available on this topic in the South African setting, and much of what we know is extrapolated from studies conducted in the rest of the world.

South Africa provides a unique environment for children with one of the most progressive constitutions in the world, while simultaneously it is one of the most violent countries in the world, with violence against infants recurring as a theme (Hsiao, Fry, Ward, Gants, Casey, Zheng and Fang, 2018). This study reports on the approach of prehospital emergency care providers to the abused infant, their attitudes and knowledge regarding the laws and their perceived responsibility in the care of the abused infant.

1.8 Layout of the dissertation

CHAPTER1: Introduction

CHAPTER2: Literature review

CHAPTER 3: Methodology

CHAPTER 4: Results

CHAPTER 5: Discussion

CHAPTER 6: Limitations, Recommendations and Conclusions

1.9 Summary

In this chapter, child abuse was identified as a global problem, and the problem specifically relating to the emergency medical services within the South African context was outlined. Legal requirements for the reporting of abuse, as well as the problem with recognition of infant abuse in the prehospital setting have been outlined. The problem has been stated and the objectives of the study have been detailed. Chapter Two provides a description of the literature of relevance to this study.

CHAPTER 2 - LITERATURE REVIEW

2.1 Introduction

This literature review focused on the international and South African literature in the field of child and infant abuse, with a specific focus on the physical abuse of the infant.

Included, are some of the relevant theories of adult learning used to create the online learning intervention, as well as some background to the adult learner and learning processes.

The review outlines the prevalence of abuse in the infant population both globally and in the South African environments, as well as the difficulties associated with recognition and reporting of abuse in this special population.

The importance of education for prehospital emergency care providers as a method for improving the recognition and reporting of abuse in the infant population is explored. The relevance of an online intervention was also explored.

Literature was searched using Pubmed, EBSCO Host, Ovid and Science Direct databases. Search parameters included terms such as “infant abuse”, “abuse in the infant population”, “recognition of infant abuse”, “the paramedic’s role in recognising abuse in infants and children”, “recognition and reporting of infant abuse” and “abuse in the prehospital setting”. Literature was also searched to cover the topics about adult learning using the following terms “adult learning theories”, “online educational interventions”, “constructivist theories and adult learning”, “teaching the adult learner” amongst others.

There was no limit placed on the timeline for the search of references used in the literature review. While there are references that would be considered “old” in the field, these references serve the purpose of highlighting that the recognition of abuse in the infant population has been an ongoing concern, and the barriers to reporting of abuse have been present for decades and is not a new problem.

2.2 Abuse Defined

The World Health Organisation (WHO) uses the following definition of abuse:

“Child maltreatment, sometimes referred to as child abuse and neglect, includes all forms of physical and emotional ill-treatment, sexual abuse, neglect, and exploitation that results in actual or potential harm to the child’s health, development or dignity. Within this broad definition, five subtypes can be distinguished – physical abuse; sexual abuse; neglect and negligent treatment; emotional abuse; and exploitation” (WHO,1999, p.1).

The focus of this literature review was physical abuse, and specifically physical abuse of the infant patient. The definition places the context of this abuse into a “bigger picture”.

Abuse can also be defined as any activity that is not the accepted norm for a particular culture, making abuse a difficult concept to define, as it is so objective (Duhaime, 1998). Abuse within the child and infant population is so dependent on the cultural norms of the society in which it occurs, it is very difficult to document a global definition that can be universally implemented. This makes the enforcement of laws around abuse difficult to maintain as there are no absolute boundaries against which to hold perpetrators responsible.

This is evidenced by the different approaches to punishment for children around the world. In some societies, the application of corporal punishment is accepted, while in others, this practice is frowned upon. The extent to which corporal punishment is applied is often based on the acceptance of violence in the specific society. These boundaries are usually blurred and difficult to define. Social tolerance of violence is learned in childhood using corporal punishment and witnessing of family violence (among other social clues) (WHO, 2009). Cultural and traditional norms are different for every society (WHO, 2009) and are also different for different elements of a single society. This means it is very difficult to pin down abuse on a global scale. The WHO definition casts a wide net but leaves much up to the discretion of society to enforce.

Infant abuse, specifically physical abuse, occurs in places that are not public; clues to the abuse exist only within the infant’s home (Weintraub, et al., 2002), against victims who are unable to speak out, and within families where cultural identities are varied. As such,

defining and recording the prevalence of abuse in this population is often an impossible task (Ferguson, 2016).

2.3 Global and South African perspectives on abuse

Abuse of the infant and child is a global problem. Mortality in children less than five years of age has been identified as a global issue, resulting in the development of the United Nations Millennium Development Goal to reduce childhood mortality by 2015 (United Nations, 2015) in a report published in 2015, comparing the goals set by the United Nations in 2000 and the actual achievement of those goals, it was noted that the mortality rate in children under the age of five has more than tripled globally from 2000 – 2015. Globally, the incidence of infant abuse is a concern, from developing countries to those that make up the “first world”, abuse is rife.

German statistics indicate that around three deaths per year in children under the age of six are due to abuse, and 1/50 cases reported as SIDS (Sudden Infant Death Syndrome) are found to be as a result of trauma to the brain from shaken baby syndrome (SBS) (Matschke, et al., 2009). The same study reported that over 90% of all serious injuries to the brain in children under one year were because of abuse. Canadian statistics indicated that 30 out of every 100 000 injuries to infants (under the age of one) were because of inflicted injury (Barr, Barr, Fujiwara, Conway, Catherine and Brant, 2009).

In the United States of America, it was reported that 95% of all serious intracranial injuries were because of an inflicted injury (Committee on Child Abuse and Neglect, 2001). Abuse of children in the USA is common. An estimated 1570 children died each year as a direct result of abuse, while 9.1/1000 children were the victims of abuse or neglect (Tiyyagura, Gawel, Koziel, Asnes and Bechtel, 2015). Unfortunately, statistics surrounding the incidence of abuse in infants are less readily available, and abuse statistics in children globally are considered to be conservative due to underreporting (Ferguson, 2016). A 2002 study determined that one in eight children in the USA would be the victim of abuse or maltreatment by the age of 18. This study finding was based on reported and

substantiated cases of abuse (meaning the actual number is suspected to be much larger) (Jackson, et al., 2015).

In Sweden, abuse is also common, with reports of children in high-income countries who are exposed to abuse being anywhere from 4-16% (Talsma, et al., 2016). Data from the less influential areas of Eastern Europe suggest that 10% of children seen in general practice had been exposed to abuse in the year 2012 (Talsma, et al., 2016).

If these statistics are the reported norm in the developed world, the infant in the developing world may be at higher risk based on reporting systems, access to health care and other socio-economic factors. Infant abuse is a common occurrence globally, with prevalence in developing countries higher than in “the first world” (Akmatov, 2011). A study of 28 developing countries reported a prevalence of 64% of children in the African region being exposed to moderate abuse while 43% had experienced severe abuse (Akmatov, 2011).

Children (people under the age of 19) make up 37% of the South African population, and 10% of the population is represented by children under the age of 4 (Statistics South Africa, 2017). This means that more than a third of our population in South Africa are “vulnerable citizens”. Approximately 10% of the South African population are children under the age of four years (Martin, 2017). Children under the age of five in South Africa have the highest rate of homicide (17.9/100 000 in males and 12.7/100 000 in females), which is six times higher than similar settings in developed countries (Van As, et al., 2011).

South African Child Welfare reports an increase in abuse in South Africa over the last few years, and South Africa has the highest number of orphans and neglected children in the world (Malki, Van As and Geduld, 2014). South African children appear to be at high risk of abuse due to a number of social, cultural and financial issues.

In South Africa over the period 1999-2005, there were 99 586 trauma-affected paediatric cases of which 1037 were found to be as a result of abuse. Of these, 64% were abuse against male children with a mean age of 44 months (3.6 years). The group identified to be at the highest risk were children younger than three years of age (Malki, et al., 2014).

Cases of abuse and risk of abuse are reported differently as not all incidences of abuse are taken to court or investigated fully for presentation to court. Only cases that are determined to be prosecutable are taken to court. This explains the possible discrepancy in the age group most commonly reported in cases.

2.4 Global and South African reporting laws

Laws about the protection of children are common to many countries in the world. The United Nations Convention on the Rights of the Child is a treaty, which describes protection of the child and has been signed by more than 160 countries worldwide. This treaty specifies protection of the child from violence, abuse and exploitation. “The Convention on the Rights of the Child is the most rapidly and widely ratified international human rights treaty in history” (UNICEF for every child, 2018, p.1). Results from a study reporting on countries that have implemented mandatory reporting laws for adults in the case of child abuse, found that 74% of low and middle-income countries and 63% of high-income countries have national laws requiring mandatory reporting of children at risk (McTavish, Kimber, Devries, Colombini, MacGregor, Wathen, Agarwal and MacMillan, 2017)

In Sweden, the reporting of suspected child abuse is mandated by law and physicians are required to notify child protective services of all suspected cases (Talsma, et al., 2016). In the United States, the laws regarding reporting the suspicion of abuse are also mandated. Not only are doctors, nurses and hospital providers mandated to report, but this extends to the prehospital environment as well as to any provider who has contact with children (Markenson, et al., 2007).

The law in the United States of America (USA) mandates all health care professionals with the responsibility for recognising and reporting cases of suspected child/infant abuse (Tiyyagura, et al., 2015). Similar laws exist in other countries around the world including (but not limited to) the following: Canada, Saudi Arabia, Sweden and Australia.

All health care professionals are “mandatory reporters” in the eyes of the South African law. Abuse in any form must be reported by anyone in contact with children, this includes the prehospital emergency care provider (Children’s Act 38, 2005. Section 110).

Abused infants are often treated in the prehospital and emergency department (ED) environments. This is because of the acute nature of the injury/illness in the infant and child, as well as the rapid deterioration often associated with head injuries and “shaken baby syndrome” (Tiyyagura, et al., 2015). Emergency Medical Services (EMS) and emergency department staff are often the first port of call for these infants and their caregivers/parents (Dessena, et al., 2015). This places the emergency medical provider (prehospital provider) at a distinct advantage for the recognition, reporting and escalation of these cases (Markenson, et al., 2007).

The Constitution of South Africa makes provision for the protection of all people within the boundaries of the country; it also makes provision for the rights of all citizens to be upheld above all else. The Children’s Act (Children’s Act 38, 2005. Section 110) further specifies these rights and the correct action to be taken in the case of a breach of the law. Section 110(1) of the Children’s Act is very specific that any *suspicion* with a reasonable possible conclusion of abuse or maltreatment be reported by ALL people who are in contact with children, specifically mentioning health care providers.

As a result, all providers are required to report any case where there is suspicion and are protected by the law if they are wrong about the reasonable conclusion drawn (Hendriks, 2014). Section 110(3) of the Children’s Act (Act 38, 2005) makes specific provision for the protection of those seen to be mandatory reporters in the eyes of the law, stating that even if the suspicion of abuse is incorrect, the reporter is protected provided the report was made in good faith.

2.5 Non-reporting of abuse by “mandated reporters”

Despite the existence of progressive and strict laws within the boundaries of the country, South Africa is still widely regarded as a violent society, with specific cultural and socio-economic conditions that create an environment rife with abuse towards vulnerable populations, specifically children. “Given the scale of the child abuse problem and the lack of resources mandated to protect children, it can readily be deduced that children will not be adequately protected” (Hendriks, 2014, p. 550).

Only 31% of prehospital emergency care providers in an American study from 2007 were aware of or understood their role as “mandatory reporters” (Markenson, et al., 2007). In Sweden, where health care providers are also required to report abuse, only 10% of reports of child abuse originated from general practitioners (Talsma, Bengtsson Boström and Östberg. 2016); 67% of general practitioners also failed to report a suspicion of abuse in another Swedish study (Borres and Hägg, 2007). In many states in the US where prehospital care providers are mandated reporters, they are not aware of this, or what it means within the law (Markenson, et al., 2002).

In South Africa, healthcare providers face similar situations to those in the rest of the world, with similar gaps in their knowledge around the reporting of abuse in the infant population. Globally the problem of non-reporting of abuse is prevalent, with many reasons for non-reporting of abuse cited. These reasons are not specific to the context in which these studies were conducted, instead they seem to be global findings. The difficulty in being objective about the case of infant and child abuse can result in much discomfort for the medical provider around the reporting and management of the case, often to the detriment of the child in question (Tiyyagura, et al., 2015).

It is not well understood why “mandated reporters” don’t report suspicion of abuse as frequently as they should, but possible reasons have been identified. Mandated reporters may not know to whom they are required to report the case of possible abuse. A South African study conducted in 2015 reported that prehospital emergency care providers are not always sure to whom the report should be made and how it should be documented (Dessena, et al., 2015). Prehospital providers were uncertain of the diagnosis in some

cases (Talsma, et al., 2016; Regnaut et al., 2015) and more concerningly, were unsure of their role as “mandatory reporters” (Markenson, et al., 2002).

Practitioners report that they find it challenging to interpret clinical and social evidence in the emergency department, as the time with the infant is usually short and the family interaction limited, making it a challenge to identify abnormal behaviours and clinical evidence (Sanders and Cobley, 2005).

Often there is little proof, and the information presented is not complete, making decisions about abuse difficult (Sanders and Cobley, 2005). Diagnoses of abuse are usually not based on concrete evidence, especially in the early stages. They are often based on gut feel and experience of the provider, making the diagnosis very subjective (Richter and Dawes, 2008). Providers in several different studies (both national and international) (Tiyyagura, et al, 2015; Alvarez et al, 2004) were not sure of their role and the extent to which their responsibility extended in the reporting of abuse. When an infant was involved, and the suspicion was less certain, this proved to be a major reason for providers not filing the appropriate report (Tiyyagura, et al, 2015). Providers also reported feeling a sense of responsibility to the families of the child involved. It was reported that specifically doctors or providers who had existing relationships with the families found it difficult to report possible abuse (Alvarez et al, 2004).

Healthcare providers were afraid to report a possible case of abuse for fear that if they were wrong there would be damage done (Tiyyagura, et al, 2015). More-so, providers appeared to be unaware of the intricacies of the law with regard to their role in reporting abuse, with providers reporting that it was not perceived to be a problem for the emergency department (ED) to deal with (this can be extrapolated to the EMS environment where care is of even shorter duration and the focus is on getting the patient to a facility as soon as possible). In the 2015 study conducted by Tiyyagura, the respondents requested more “case-based” learning opportunities to apply information in real-life scenarios, as well as access to online support in the form of child protective services consultation for more difficult/vague cases.

Mandated reporters are often afraid of offending the parents of possible victims of abuse, which may contribute to the failure of these providers to report possible cases of abuse.

It is concerning that although the laws regarding the reporting of abuse in South Africa are clear, and non-reporting of suspected abuse may carry jail time or a hefty fine, people who are required to report suspected abuse are not often held accountable when reports are not made (Hendriks, 2014).

The system for reporting abuse in South Africa is fraught with red tape. Frequently the reporting of a case will depend on the person contacted at the police station or hospital. It appears that frequently, the officers responsible for opening the cases and obtaining initial statements for the reporting of abuse are not sure what is required of them, or the mandated reporter. There is no South African information on the process of reporting a case and where the problems in the police and legal system are, but anecdotal reports indicate that opening a case of abuse with the appropriate authorities is difficult, and laborious, and often not carried through with as the system makes reporting challenging.

2.6 The infant at high risk

A 2015 American study determined that 20-30% of children who died because of abuse or neglect, were seen in an acute care setting, and the injury/illness was not recognised (Tiyyagura, et al., 2015). These patients were seen and treated by either emergency department staff or prehospital emergency care providers and then discharged to the care of the abuser. Abuse in the infant population is distinctly difficult to recognise, making the infant population a high-risk population for the failure to recognise and report abuse, and possibly accounting for why these patients were allowed to return home to their abusers without being recognised as infants who had suffered abuse.

Recognition of infant abuse is challenging and may be missed on a first assessment if the practitioner is not specifically looking for the signs of abuse, or if the provider is not aware of the signs of abuse. Worlock, et al (1986) state that approximately 50% of the children who are reported as abused have been examined by a medical provider on a previous visit, and not recognised as a potential abuse victim. This is mirrored in more recent studies with this number reported at 75% in 2008 (Flaherty, et al., 2008). In another study, 41 % of victims of child abuse had previously been seen or had been in contact with child protection services (Markenson, et al., 2007).

Often the first obvious clinical finding is that of a severely injured child, as the child cannot be kept at home anymore with the severity of injury. It is reported that up to one- third of infants under the age of three months who present with a head injury caused by abuse are not initially recognised as abuse victims (Van As, et al., 2011). Up to 27% of children in the United States who present with signs of severe abuse had been seen by child protection services previously (Jackson, Kissoon and Greene, 2015).

These were often reported as minor injuries after the more serious injury was discovered (Jackson, Kissoon and Greene, 2015), highlighting the fact that these patients are not recognised on initial presentation. Of these minor injuries, 80% were later noted to be bruises (this was especially suspicious in infants who were pre-mobile, those not walking or crawling yet) (Sheets, Leach, Koszewski, Lessmeier, Nugent and Simpson, 2013).

The presentation of abuse in the infant population is varied, and non-distinct from many other possible injuries/illnesses in the infant population (Duhaime, Christian, Rourke & Zimmerman, 1998). Infants are unable to articulate what is wrong with them or where they are experiencing pain. This makes the presentation very difficult to differentiate from other presentations such as:

- An initial complaint of seizures, (Duhaime, et al., 1998; Rocourt & Nwomeh, 2011) or infantile spasm,
- A complaint of respiratory distress (Herendeen, 2002),
- A change in the level of consciousness, or lethargy (Herendeen, 2002) or apparent unconsciousness may be the initial presentation,
- Episodes of apnoea (Kemp et al., 2003).

Signs of physical abuse in the infant population are often subtle and non-specific; there is often no sign of external damage or injury (Thalaysingam, et al., 2012), making recognition of abuse in this population very difficult. Clues to the abuse may exist only within the infant's home (Weintraub, Lazzara, Fuchs and Wiltsek. 2002), meaning that when the child is brought to the emergency department, much of the story of the patient injury is lost to the in-hospital provider, as they are not able to access the site or scene of the injury. This means assessment of mechanism of injury relies on what is relayed by parents and caregivers.

Infants are unable to articulate occurrences/histories, and this makes understanding the mechanism of injury in this group of patients particularly challenging. Histories and information reported by caregivers in the case of the abused infant are often vague and non-specific (Duhaime et al., 1998) making interpretation of the presenting problem a challenge.

Infants are also at higher risk of injury to the brain and spinal cord, and death due to the structures of the nervous system and their developmental timelines. Some of the anatomical reasons for increased risk (specifically of brain injury) are presented below:

- Infants have large heads (that are relatively heavy) in relation to their bodies, this means a large amount of their surface area is made up of the head. Infants who are injured are likely to be injured on the head due to the relative size (Ludwig and Warman, 1984)
- Infants have weak neck muscles and poor head control. When an infant is exposed to physical forces that cause movement of the head, they cannot resist that movement. This puts them at higher risk for trauma to the neck and internal structures protected by the skull (Warman, 1984; Rocourt & Nwomeh, 2011)
- The central nervous system (CNS) of the infant is poorly developed and is not yet mature, meaning the structures that make up the CNS are friable and thin. The vasculature of the CNS is also very friable and easily damaged with minimal force (Warman, 1984)
- The brain of the infant is not yet fully myelinated, leaving the tissue at high risk of damage due to force. The different densities of the white and grey matter also increase the risk of damage due to acceleration/deceleration forces (Warman, 1984)
- Infants have no method of communication except to cry. This puts the infant at higher risk as they cannot articulate the problem they are experiencing and parents who are tired and stressed are more likely to have an adverse physical reaction to a crying infant who cannot be consoled (Warman, 1984). Inability to communicate verbally also limits reporting as the infant cannot articulate what happened to them if they have been assaulted.
- The younger the infant, the higher the risk of death from abuse (Warman, 1984), with children under three years of age being at the highest risk of death (Rocourt & Nwomeh, 2011) due to the points specified above.

2.7 Factors that increase the risk of abuse

All children are at risk for abuse (Jackson, et al., 2015), however, there are a number of recognised family, history and clinical factors, which place certain infants at higher risk for possible abuse (Jackson, et al., 2015).

While risk factors are important as clues to possible victims of abuse, it is important to note that abuse can occur in any family, regardless of race, ethnicity, education level or social standing. There is no family, culture or grouping that is impervious to abuse, and it is vital that prehospital care providers are open to the possibility of abuse with ANY child who presents following trauma (Jackson, et al., 2015).

These risks are identified throughout the literature, and include but are not limited to:

- Younger mothers (Sanders & Cobley., 2005; Duhaime, 1998)
- Single parent/caregiver (Van As, et al., 2011)
- Child taken care of by someone who is not their blood relative (or not biologically related to the abuser) (Thalaysingam, et al., 2012)
- Sick infants (for example colicky babies) and those who are considered “fussy” (Matschke et al., 2009) and infants with disabilities are also at increased risk (Duhaime, 1998). Infants with congenital anomalies and pre-term or low birth weight infants are also at higher risk (McNaughton, 1997).)
- Parents who use alcohol or drugs (Sanders & Cobley, 2005; Richter & Dawes, 2008; Van As, et al., 2011; Matschke et al. 2009)
- Poverty or low socio-economic status (Richter & Dawes, 2008; Matschke et al. 2009)
- Unstable family life (Duhaime, et al., 1998.; Van As et al. 2011)
- Children and infants under the age of three appear to be at higher risk (Duhaime, et al., 1998)

Poverty in the developing world is thought to play a role in the incidence of abuse. In South African society, it is reported that 71% of children live in a household where none of the adults are employed (Richter and Dawes, 2008), while 17% of children in South Africa live in an environment where the whole family inhabits one room. Under such conditions of poverty, protection of children's rights is difficult, and the system is maximally strained just providing schooling, food and clothing to these children (Richter and Dawes, 2008). Unemployment and family stress, as well as patriarchal societal norms often lead to physical punishment for children, and increased abuse (Richter & Dawes, 2008). Developing countries tend to have these conditions in common for vast majorities of their inhabitants.

The following factors in the history/clinical presentation of the patient also allude to the risk of non-accidental injury. Although these elements are not conclusive, it is important to remember that the whole clinical picture with these historical findings may point the provider in the direction of possible abuse. Education of the prehospital emergency care provider in these findings may assist in faster and more certain recognition of possible abuse. The factors listed below, when found in conjunction with physical findings suspicious of abuse, may increase the certainty of the differential diagnosis of abuse in the infant population:

- History that is not forthcoming or very vague (Van As, et al., 2011; Duhaime, et al., 1998)
- Unexplained injury (Van As, et al., 2011) or injury that does not match the mechanism described by the parents (NSW Health. 2011)
- Clinical findings of trauma with no information as to how the trauma was sustained (Van As, et al., 2011) for example, head injuries with minimal history or history of a mechanism that doesn't match up to the severity of the injury found (Duhaime. et al., 1998)
- Often with cases of abuse there is a delay in seeking care (Van As, et al., 2011) when the infant or child is injured severely, or the injury is concerning. This is highly suspicious of abuse. This correlated with the fact that in the study quoted 30% of

non-accidental injuries presented 24 hours after original insult (Thalayasingam, et al., 2012)

- Repeat injuries, or patient repeatedly presenting with numerous and varied presentations (Van As, et al., 2011)
- Alleged third party involvement with no clear information from the caregiver at the time of possible injury (Van As, et al., 2011); histories that change with time and provider (depending on who is taking the information) (Van As, et al., 2011)
- An injury that is severe where another child is blamed for the injury (NSW Health, 2011)
- History that changes once the caregiver is faced with specific findings that do not match the vague history often given at first (Van As, et al., 2011)
- Evidence of previous or old injuries (especially in the same bone or area) (NSW Health, 2011).

The abused infant's behaviour toward the abusive parent is not a reliable factor in determining the risk of abuse. Children turn innately to the parents or caregivers in their lives to provide direction and will often do almost anything to avoid being separated from their "norm". For this reason, the ability of a parent to console an infant is not a good indicator that the relationship between the parent and caregiver is a safe one for the child (Sullivan and Lasley, 2010).

In South Africa, there are cultural and social factors that place the infant at risk. These include (but are not limited to), the migrant workforce issue where men who work in urban areas but reside in rural areas, may have more than one family. The risk being that children of the second or third partner are not seen as "as worthy" as the children with the first partner/wife (Richter and Dawes, 2008). The patriarchal organisation of the family unit in South Africa may present a challenge for the child in abusive situations, especially in environments where it is culturally acceptable for children to be punished and disciplined using corporal punishment and other forms of physical violence.

2.8 Sudden infant death syndrome and the pre-hospital emergency care provider

Under South African forensic law (Du Toit-Prinsloo, Dempers, Wadee and Saayman, 2010), the diagnosis of SIDS (Sudden Infant Death Syndrome) can only be made as a diagnosis of exclusion. This means that all other possible causes of death of an infant must be investigated and ruled out first. SIDS only exists when an infant is found to have died, with no cause of the death.

There are several differential diagnoses which must be ruled out before SIDS can be stated as the cause of death. These include:

- Trauma
- Existing medical conditions that may have led to the death
 - Infection
 - Congenital anomalies (cardiovascular system, nervous system, liver, renal system, gastrointestinal system, respiratory system)
 - Inborn errors of metabolism
 - Hypoglycaemia/hyperglycaemia
- Asphyxia (intentional or non-intentional)
- Environmental issues
 - Hyper/hypothermia
 - Poisoning or intoxication (intentional or non-intentional) (Hanzlick, 2001)

In South Africa, when an infant has an existing medical condition that has received treatment and has died, the death may be regarded as having resulted from natural causes. Any death in South Africa that is sudden or unexplained should be investigated under the Inquests Act 58 of 1959, which requires that the body be admitted to a medico-legal mortuary for autopsy and further investigation (Du Toit-Prinsloo, Dempers, Wadee and Saayman, 2010).

2.9 Recognising non-accidental injury in the infant

2.9.1 Skeletal injury patterns

An isolated injury is not considered to be the most reliable clinical finding of child and infant abuse (Van As, et al., 2011). More useful in the diagnosis of abuse in the infant is the finding of constellations of injury. These include but are not limited to injury to the head/skull including fractures of the skull and underlying intracranial pathology such as subdural or subarachnoid bleeds (Van As, et al., 2011) fractures to the posterior ribs (Van As, et al., 2011), fractures of the long bones (Maliki, et al. 2014), oral-facial trauma (Thornton, 2014). Injuries to the head and extracranial bleeds are common with abuse (these injuries require a fair amount of force and are unlikely, unless the cause is obvious massive trauma, such as a pedestrian vehicle accident, falls from a height or motor vehicle accidents or a non-accidental injury) (Duhaime, et al. 1998).

Where physical abuse was found, 25% of children were found to have extremity/skeletal trauma, including injuries such as long bone fractures (femoral/humeral fractures) (Van As, et al., 2011), rib fractures (specifically posterior rib fractures) and callus formation in any of the bones (Van As, et al., 2011) Callus formation refers to the finding on x-ray of a previous break in that bone, with growth around the injury leaving signs of healing. Spiral fractures of the humerus or femur, as well as fractures of the skull in the temporal or occipital areas are considered to be high risk for non-accidental injury in the infant patient (Flaherty, Perez-Rossello, Levine, 2014).

Posterior rib fractures are usually associated with high mechanism injury patterns, such as motor vehicle accidents (MVA's), pedestrian vehicle accidents (PVA's) or falls from heights (usually greater than 1,2m). When these fractures are found in the absence of a mechanism of injury, they are highly suspicious of abuse (Van As, et al., 2011). Rib fractures were one of the most common findings in infants who were later found to have been injured on purpose, this as a result of the anterior-posterior compression of the chest wall (Flaherty, et al., 2014).

Areas of the body most commonly injured were the head and neck (53% of abused children in this cohort), followed closely by the upper limbs (24% of patients) and then the lower limbs in 18% of these children (Maliki, et al. 2014). Infants have a high thoracic compliance level, meaning their ribs and rib cages can withstand a large amount of force before breaking. Broken ribs indicate the amount of force applied (Thalayasingam, et al., 2012).

2.9.2 Shaken Baby Syndrome

Shaken baby syndrome is a cluster of findings that can be related to the forceful acceleration/deceleration forces associated with violent shaking of an infant. Initially described by John Caffey in 1972. The constellation of findings that led to the diagnosis of “Caffey’s syndrome” include the following : bleeding into the retina, evidence of subdural and sometimes subarachnoid bleeding without obvious evidence of damage to the external structures (of the skull) (Talbert, 2008).

Even in the developed world, shaken baby syndrome is a growing concern. In Germany it was reported that up to 200 cases of this presentation are recorded annually, putting the actual incidence potentially much higher (Matschke, et al., 2009). Shaken baby syndrome is reported to have a mortality rate as high as 30% with over 70% of the survivors living with long term disability as a result of the initial insult (Matschke, et al., 2009).

Rib fractures and intracranial bleeds (specifically subdural haematoma) are common with non-accidental injury, and unless there is a clear history of severe mechanism of injury, there is not really a good explanation for these injuries in an infant (Thalayasingam, et al., 2012). None of the patients in a 2012 study who presented with accidental injury had rib fractures (although 10 of them were involved in high mechanism motor vehicle accidents) (Thalayasingam, et al., 2012).

2.9.3 Other findings of relevance

Burns, drownings and bruises are common findings in the battered infant and toddler (Sanders and Cobley, 2005). Bruising on the child with no reasonable explanation is suspicious for abuse, as are bruises of a particular shape (or recognisable shape, such as in the shape of an object) (Sanders and Cobley, 2005). Diagnosis of abuse cannot be made on a single clinical finding alone. It must be based on the entire patient presentation. Detection of child abuse, especially in the infant, is a challenge and requires a skilled clinician with experience in looking for the signs of abuse. Clinical findings, social history, physical examination, and family history should be probed at depth before a diagnosis of abuse is made. This is why it is so important to refer these cases of suspected abuse to the appropriate authorities for investigation (Thalayasingam, et al., 2012).

Signs of possible abuse include but are not limited to:

- Orofacial trauma (Thornton, 2014)
 - Bruised or lacerated lips
 - Torn frenula (Flaherty, et al., 2014)
 - Bruised alveolar mucosa
 - Avulsed teeth

The findings above are concerning when not related to a history of trauma that makes sense for the infant's age and developmental status.

Burns and scalds were found to be present in up to 10% of abused infants (Rocourt and Nwomeh, 2011). Poisoning in an infant who is not mobile is also a red flag for abuse. Indications of possible suffocation should also alert the provider to the possibility of abuse.

Infants and children younger than two years who present with typical "failure to thrive" without any apparent metabolic reason may be victims of abuse. This is commonly caused by maternal neglect and malnutrition (reported in up to 50% of cases of failure to thrive) (Van As, et al., 2011). Another concerning sign of possible abuse of an infant is an infant who presents with feeding difficulty, irritability and vomiting with no infective cause. Often these cases are thought to be due to meningitis or other viral infections of the

gastrointestinal tract (Committee on Child Abuse and Neglect, 2001). These findings cannot be used in isolation, as they are the signs of many possible problems.

Respiratory problems have been associated with possible abuse. Respiratory distress is a common presenting complaint, potentially as a result of posterior rib fractures sustained during a shaking episode (Herendeen, 2002). This can be as a result of damage to the posterior ribs as well as the underlying soft tissues of the lungs (Flaherty, et al., 2014).

Seizures were up to five times more common in non-accidental or inflicted injury in infants (Thalayasingam, et al., 2012), and patients were likely to be more severely injured with lower levels of consciousness on initial presentation if the injury was non-accidental.

2.9.4 Accidental Injury Common Findings

Infants are sometimes the victim of injury that is accidental in nature. When these injuries do occur, there are several factors that point to an accidental cause. Again, these findings are not specific, but when grouped together with the clinical information, presentation and general picture of the injury, can be used to assist in decision making for the provider.

- Accidental injury commonly occurs when in the care of the primary care giver (parent); 92% of the patients who presented with trauma that was found to be accidental in nature, were with their parents at the time of the injury (Thalayasingam, et al., 2012).
- Infants who sustained an injury accidentally presented to the emergency department or to prehospital staff much earlier than those who were injured intentionally; 89.5% of patients injured in an accident presented immediately as compared to 54% when the injury was inflicted (Thalayasingam, et al., 2012).

When these findings are compared to the rest of the clinical picture, a decision about the need to report the case can be made. The important point here is that cases with even a suspicion of non-accidental injury should be reported, because it is better to investigate the circumstances of the infant who is not at risk, than to miss the infant who is at risk.

2.10 Emergency care providers and barriers to reporting

Due to the paucity of information on the infant in the abuse situation, reference will be made to existing studies that detail information regarding both children and infants. Infant abuse is poorly reported at all levels of the healthcare system, with reports suggesting that as many as 40% of mandated professionals have failed to report a suspicion of abuse at some time in their careers (Alvarez, Kenny, Donohue and Caprin, 2004). Internationally, reports suggest that despite the fact that possible abuse was suspected and documented, it was not reported to the correct authorities in over 50% of cases of deceased children (Lynne, et al., 2015).

Prehospital emergency care providers are uniquely poised to recognise abuse of the infant, as they are the only providers invited into the homes and scenes where abuse may be taking place (Markenson et al., 2002). It is reported that 50% or more of the callouts received by EMS in Chicago were to homes or environments where children live (Weintraub, 2002). It is accepted that EMS providers and prehospital care providers have unique access to the home lives of children.

It is important that these providers have the appropriate training to enable them to recognise, report and intervene in these cases (Markenson et al., 2007). Knowledge of the local laws and requirements in terms of reporting as well as application of the correct procedure in reporting are all challenges that can be corrected relatively easily with an education programme and a system that supports providers who find themselves in a situation where a report must be made (Tiyyagura, et al, 2015).

The role of the healthcare provider in child/infant abuse is to treat the acute and life-threatening problem and detect and report the suspicion of abuse to the appropriate authorities (Van As, et al., 2011). What is known is that abuse in the infant population is difficult to recognise, and once recognised is difficult to report and follow up on as intricate family relationships and fear of applying the law appropriately make reporting difficult. Knowledge with regard to the requirement of prehospital providers to report in certain circumstances is scarce and there are not many specialists in the field available to consult with prehospital staff.

A barrier to reporting is that providers are often unsure just what needs to be presented in a report, and the level of detail required. In addition, prehospital providers often have limited clinical exposure to the infant/child. This coupled with minimal exposure to the case of infant or child abuse in training makes it difficult to recognise the infant who has been abused, or is at high risk of abuse (Markenson, et al., 2002). Even if the infant is recognised as an at-risk patient, the practitioner is often not able to determine what should be stated in a report, to whom and where the report should be filed, or the laws that mandate reporting of the incident in the first place.

Another barrier to consider is that the conviction rate in reported cases in the child abuse arena in South Africa is low. Providers may see this as a reason not to report, as even if they report, they don't see a benefit for the child (Richter and Dawes, 2008). It makes sense that if prehospital emergency care providers are aware that the conviction rate for abuse perpetrators is so low, they may not be willing to make the report. In a study conducted in Cape Town, 60% of cases of reported child abuse in 2017 were withdrawn before they were taken to court, and only 12% of the perpetrators were found guilty of abuse (Jamieson, Sambu and Mathews 2017). These statistics are disheartening, as of the cases reported, 60% of these cases did not have enough information to prosecute the abuser. There were some reports of missing paperwork and chain of evidence errors which led to case dismissal. This does not breed confidence in the system, and may be one of the reasons why prehospital emergency care providers will not always report cases of abuse.

There is insufficient data on the methods for reporting infant abuse in South Africa, and resources aiding the prehospital emergency medical care provider are not easily available to assist with the reporting of these cases. Although information on the incidence of reporting of abuse through medical providers in South Africa is scanty, there is some information reported about the relationship between the police and social services who take reports from the public and should refer on to the other party. There is a disconnect between the social services and police services in this regard with only 19% of the cases reported to the South African Police Services (SAPS) being referred on to the social services and only 8% of the cases reported to social services were referred to the SAPS

(Jamieson, Sambu and Mathews 2017). If these are the statistics that indicate reporting between governmental departments, the referral between medical providers and SAPS can be hypothesized to be even worse.

2.11 EDUCATING THE PROVIDER

Prehospital staff are not exposed to much training in the topic of abuse and how to manage or report these cases to the appropriate authorities. EMS education focuses on clinical knowledge and skills, with minimal education or exposure to the non-technical skills often required in the prehospital environment. In a 2015 study in South Africa, it was determined that the EMS provider often didn't know to whom to report cases of suspected abuse (Dessena, et al., 2015). It was also determined that staff were not sure about their own rights and protection by the Children's Act No 38 of 2005, meaning that they were afraid to report cases of suspected abuse due to the fact that they thought they could face legal action if their suspicion was incorrect (Dessena, et al., 2015). These findings have been replicated in other countries, that have similar reporting laws as South Africa.

Providers are not always aware of the laws prescribing reporting and protection (Hendriks, 2014). A study in Pakistan reported that healthcare providers did not report cases of abuse due to a lack of education or knowledge on the subject (Maul, Naeem, Khan, Mian, Yousafzai and Brown, 2019). There was a fear that the healthcare provider might be wrong, or that they may misidentify abuse (this may be as a result of poor education and knowledge on the subject), as well as fear of the medicolegal consequences such as time in court, having to complete reports and interviews (Maul, et al., 2019).

More than just educating the provider about when to report, providers need to have access to simple and accessible reporting systems, in the places where children are seen and treated. Barriers to reporting must be reduced to increase the likelihood that a provider will report (Richter and Dawes, 2008). If the system for reporting is standard and easy to use, the chance of reporting may increase.

A protocol for interaction with ALL infants and children in the prehospital setting that allows for the flagging of certain infants based on risk profiling (in terms of history, clinical presentation and previous visits to the emergency department) may operationalise the reporting system and take the decision making out of the hands of the provider (Tiyyagura, et al., 2015). Respondents in the 2018 study in Pakistan requested specific institution or national guidelines for the reporting of cases of abuse (Maul, et al., 2019).

Prehospital providers are not trained with sufficient emphasis on their role as patient advocate and their legal obligation to report abuse due to the need to provide protection for vulnerable populations. Even when these providers have received some training, it is reported that they are often not sure about application of the knowledge in all situations (Dessena, et al., 2015).

In the prehospital environment, independent practitioners (Advanced Life Support (ALS) and Intermediate Life Support (ILS)) are taught about child abuse and some of the laws pertaining to the reporting of abuse in their undergraduate studies. The curricula of both qualifications are not detailed in terms of learning objectives or outcomes for child abuse. The expectation is a cursory overview of the issue of child abuse with very little standardisation about the expectations for teaching of this topic. The time required to be spent on this topic in either course is not defined, and no minimum recommendations are made about how much time should be spent learning about child abuse or reporting laws. This puts providers in the prehospital setting at a disadvantage, as the expectation is that an independent provider would be able to assess and recognise abuse (according to the Children's Act 38 of 2005), and be able to understand their role as mandatory reporters, but little emphasis is made on the requirements for teaching about the topic.

The Critical Care Assistant (CCA) curriculum (latest version published in 1998), specifies only the following objectives for teaching the student about ethics in paediatric care

- Ethical and philosophical considerations when caring for infants/children

(HPCSA, 1998). (See also pp 133-134)

A further objective is made in the CCA curriculum under the heading of emergency care of the paediatric patient:

- “Discuss briefly and explain:
 - Child abuse - physical, emotional and sexual” (HPCSA, 1998).
 - Recognise the various forms of abuse and neglect”

The curriculum makes no reference to how much time should be spent on the course covering the topics above relative to other teaching on the programme.

The curriculum from the late 1990’s has been used as this is the latest available guideline from the Health Professions Council of South Africa (HPCSA) with regard to this programme. Despite the fact that the course was offered until 2016, no mandated update or updated teaching guidelines were published about the required curriculum of this course. It was up to colleges presenting this programme to determine that the minimum requirements were met.

Some of the colleges went beyond the requirement, but what is important to note here, is that the national standard for both the AEA (Appendix B) and CCA (Appendix A) curriculum is clearly not sufficient to equip a student, who will practice as an independent practitioner, to adequately assess, manage and report a case of infant or child abuse on the prehospital setting.

The reason this CCA curriculum was not updated in any detail was due to the fact that there had been numerous movements throughout the 2000’s and the years after to officially close the CCA and AEA registers with the HPCSA. The programmes in question were designed to meet the needs of “on the job” training before access to the degree programmes in prehospital emergency care were created or accessible on a large scale. As such the programmes were intended to be presented to existing EMS and fire trained professionals as a method for the improvement of medical care without the need to requalify. The target market for these programmes was experienced EMS practitioners who would need minimal updates to their knowledge to practice at a higher level. However, for a period of time, this form of training became the easiest method for prehospital emergency care providers to escalate through the ranks, and numerous colleges began presenting various versions of the programmes with varying quality standards. Thus, the CCA course was last presented in 2016, with the AEA courses register to close by the end of 2019.

In terms of time spent on the objectives above, there is a requirement that only 10 hours be spent teaching the CCA about ethics, (this is 10 hours out of a total of 570 recommended hours theory teaching time on the course, which translates to approximately 1.7% of the total theory time allocated). Of that time, child abuse represents only one of numerous other topics that must be presented under the topic of Ethics. This means that less than 1% of the total time spent in the classroom was mandated to be spent on the topic of recognising and reporting infant and child abuse (the other topics expected to be covered under the umbrella term of ethics has been included in Appendix A).

There is little guidance for the teaching of assessment, recognition and management of abuse of the child or infant in the emergency setting in the CCA curriculum. The Ambulance Emergency Attendant (AEA) curriculum specifies less teaching time for ethics, with a recommended five hours allocated in the recommended theory time of 470 hours (this is 1.06% of the total teaching time) (HPCSA, 1998). These numbers are all for South African short courses for prehospital care provider training.

The greatest challenge with the curricula presented above (the CCA and AEA curricula) is that they were published before the latest update to the Children's Act, and as such do not meet the requirements for adequate teaching about the act that is relevant in this case. The Children's Act was last amended in 2005, whilst the CCA curriculum was amended in 1998, and the AEA curriculum was last updated in 1996.

The Bachelor's degree in Emergency and Medical Care (BEMC) provides for an increased amount of time to the study of child and infant abuse. Depending on the higher institution offering the degree, the topic may be covered in either "Foundations of Professional Practice" or "Paediatric and Neonatal Emergency Care". Both of these subjects are 12-credit (120 notional hours) subjects and are offered in the first year of the four-year degree programme (Foundations of Professional Practice) and in the final year of study (Paediatric and Neonatal Emergency Care).

Only one learning unit in each of these subjects is dedicated to the teaching of law and ethics, as well as the clinical signs of and reporting steps in child abuse. Thus, depending on the institution, this topic is allocated between four and 12 hours in the entire

programme. It should be noted that this time allocation is not specific to the recognition and reporting of child or *infant* abuse. In the paediatric module the recognition and reporting of abuse in the paediatric population is specifically noted, with the role of the prehospital emergency care provider as a mandatory reporter overtly stated (these objectives can be found appendix B).

Despite the improved emphasis on the recognition and reporting of abuse in the paediatric population in the degree programme, teaching of the topic occurs twice in the four year degree, and is still allocated less time than may be required to adequately equip the provider to recognise and report a case of abuse in an infant.

There is insufficient emphasis on the role of the prehospital provider in the recognition and reporting of abuse (Lynne et al., 2015) and not enough time is spent on education in these topics (Dessena, et al., 2015). This problem has been reported in the United States, the United Kingdom and other European countries as well as in South Africa.

More training is needed in the field. In a study conducted in the USA, 78% of respondents requested extra learning opportunities on the reporting of abuse in the paediatric population. A study conducted in South Africa reported similar findings (Markenson, et al., 2007; Dessena, et al., 2015).

Training of the providers has been shown to be a useful method to increase the chance that medical providers will report (Talsma, et al., 2016). Respondents in a few of the studies requested training opportunities in the field (with specific reference to training in clinical skills and reporting skills) (Markenson, et al., 2007; Dessena, et al., 2015). Respondents also reported that if they felt more comfortable with their ability to recognise abuse, they might be more likely to report it. Prehospital emergency care providers in a United Kingdom study in 2017 reported that where confidence is lacking, they felt ill equipped and inexperienced to report on cases of abuse (Brady, 2016). This was linked to the amount of time spent both on learning about the topic child and infant abuse, and the amount of time physically spent with the infant patient (prehospital emergency care providers in this study were not exposed to paediatric patients as much as they would have liked in order to be confident in recognising a case of abuse).

Prehospital care providers in the study above lacked skills in assessing physical factors and sentinel injuries as well as recognising factors in the history that made the suspicion of abuse more likely. Prehospital emergency care providers expressed a desire to report abuse but also reported that they did not feel equipped with the knowledge and skills to report (Markenson, et al., 2007).

2.12 THEORIES OF ADULT EDUCATION

There are numerous theories informing the education of adults. For the purposes of this study, the concepts of constructivism, experiential learning and connectivism will be discussed. These theories have been chosen and implemented in the approach taken by the author in the development of the online teaching intervention to meet the needs identified in the study.

Adult learning theory owes much of its structure to Malcolm Shepard Knowles (1968) and the concept of Andragogy ('the art and science of helping adults learn), when it was recognised that adult learners are possibly very different from the child learner. Adults require a different approach to education based on the fact that adults have very different experiences, expectations and strengths/weaknesses to children. When attempting to create any intervention for the education of the adult learner, the approach and tools must be thought out to achieve the requirements specific to the adult learner.

Knowles made five basic assumptions about the adult learner:

- The adult learner has a concept of self already. This means that the adult learner already knows what does and doesn't work for them. They are usually more self-aware and comfortable within their beliefs and practices.
- The adult learner has a number of past learning experiences. This makes the adult learner a challenge in that previous bad experiences can hinder further development, however, they have a multitude of life and learning experiences to draw on and reference new learning to.

- The adult learner comes to most learning experiences with a readiness to learn. The adult learner is not usually forced into learning situations as children are in school, and when an adult learner has decided to engage with learning, they do so of their own free will making them ready to learn.
- Adult learners approach learning with a practical end point in mind. They desire to have a learning interaction in order to change something about their current experience. They will often have a practical application or problem in mind to drive the learning and so it must be immediately applicable.
- The adult learner is generally internally motivated. There is no requirement to punish the adult learner, as they generally are not learning because they are forced to, rather because they have a good internal reason for the learning or outcome of such learning (Smith, 2017).

Learning is a spectrum, and no one learner can be described by the assumptions made above. Rather these assumptions provide a skeleton for the design of educational interventions for the adult learner.

Knowles also suggested the following strategies to increase the effectiveness of teaching for the adult learner:

- Motivate the adult learner by using systems that allow for free navigation through the different learning topics. Give the adult learner a sense of autonomy in how their learning is achieved. Using real life examples can make the learning more relevant to the adult learner and motivate their continued interaction (Palis and Quiros, 2014)
- Learning should be task-based and not memory based. Allowing the learner to apply what has been learned rather than having to remember what has been learned and regurgitating it at will (Pappas, 2013). Using problem solving in the learning tasks will assist the adult learner to actively engage and interact with the intervention (Palis and Quiros, 2014).
- Make the learning relevant to the adult learner's real life. The learning must be applicable and useful, or it will not be valued (Palis and Quiros, 2014).

- Understand that the group of learners will have a broad set of pre-existing knowledge. Use this existing knowledge as a foundation to build on (Pappas, 2013).

While Knowles' description of the adult learners' needs are worthy of consideration, it must be acknowledged that his work was never submitted to empirical investigation for substantiation. There are several theories of learning that apply to the adult learner in this study. These have been discussed with reference to the method of learning used in the online intervention developed.

The learning intervention developed in this study was greatly influenced by the constructivist approach to learning.

2.12.1 The Constructivist Approach

The constructivist approach to learning suggests that all learning starts with building on previous knowledge. The adult learner has a wealth of previous knowledge, and often requires refinement and reflection to achieve the new learning. Often new scaffolding and structures for learning do not need to be created, as these already exist (Taylor and Hamdy, 2013). Learning is a psychological and cognitive process in which perception and information processing results in a change in behaviour. This change in behaviour and understanding is an indication that learning has occurred (Taylor and Hamdy, 2013). The constructivist approach to learning is a student-centred approach, meaning the student is the focus of the learning and not the instructor. For this reason, much of the teaching that follows a constructivist approach allows for the use of the student's experience in learning, use of previous knowledge and personal motivation to drive the learning (Bhattacharya and Han, 2010).

Adult learners, specifically in the emergency medical field are required to interact with learning, not just passively, but in an active manner in order to apply it appropriately in the high-stakes environments in which they work. The constructivist approach leans on the student's need for practical, problem solving learning to achieve the requirements

(Lanier, 1997) The student is assumed to be driven by the need to practically apply the information taught. An online intervention is able to engage the learner in reading, videos, sound and other resources to enhance learning and interaction.

Learning can be described as a change in one or more of the three domains: attitudes, skills and knowledge (Taylor and Hamdy, 2013). Learning is acquired or achieved when one of these domains is affected. The aim of the online learning intervention was to affect all three of the domains, with skills being developed through the interaction with cases and examples, knowledge developed through interaction with the presented facts and information, and attitudes being formed through the presentation of access to referral pathways and a tool for the documentation of clinical condition.

Piaget's idea of constructivism included two major principles that assist in guiding growth and development, namely, adaption and organisation. Humans have the ability to adapt to changes in their environment and allow those changes to be converted to new mental models or structures (this is named adaption). The human is also able to organise these changes in a way that can be used and applied to new situations that are encountered. Constant adaption to new environments and experiences may allow for learning, and the ability to organise these new structures into accessible places to be used again in the next environment. Piaget's theory of constructivism also makes mention of the ability or readiness of the learner to change. An adult learner usually fits into the development stage associated with the "formal operational stage of development" - meaning the adult learner is capable of interacting and learning through abstract concepts, and by applying previous real-life experience to the problem presented, develops new knowledge. Adult learners are able to see concepts in their minds and imagine consequences and problems without having to be placed in the experience to learn (Battacharya and Han, 2010).

This means that the use of an online learning intervention might be helpful for the adult learner as the student is able to interact with abstract ideas and concepts

2.12.2 Experiential learning

Experiential learning relies on the exposure of the student to an experience, which is then observed or watched, thought about and then acted on. The theory applies to the interaction of the learner in a real or simulated environment (or through case studies and table-top interactions) and expands on the theory that learning is constructed (Taylor and Hamdy, 2013). This theory allows the learning to be constructed through multiple interactions (concrete experiences), reflection and thinking about the interaction in these experiences and then acted upon to correct or improve on them. Each interaction is constructed on the learning of the previous interaction. The way in which this could be applied to online learning is that the learning experience is given to the student through case scenarios, and the student is exposed to the thinking required to make a diagnosis of abuse without physically seeing an abused infant.

In this study the concrete experience was provided through exposure to the case studies. Further information provided allowed for reflection. It must be acknowledged that in an online intervention, the reflective phase is limited due to the individual nature of the activity.

2.12.3 Connectivism

Connectivism is a more recent theory and refers to the theory underpinning the growth of the internet and online methods for adult learning (Siemens, 2005). In connectivism the student is guided to information but is not given the answer. The adult learner is encouraged to engage with numerous connections and sources to meet the needs of the learning as comprehensively as possible.

The invention of MOOC's (Massive Open Online courses) allows access to learning to anyone who can access the internet and allows for the creation of a community of practice far greater than the physical location, and gives learners access to interaction with people and learning experiences outside of their normal interactions. The online intervention for

this study was created through use of a MOOC called Teachable, where online courses can be created and enrolled in for free.

Knowledge is created beyond the individual learner or producer. It is a constantly shifting and changing entity that is not controlled by anyone in particular but is available to everyone. Information is constantly ebbing and flowing, and it remains up to the learner to engage with the information available and to make meaning from it. The challenge with connectivism is tracking the creation and origin of knowledge (Siemens, 2005).

With the rise of connectivism, there is no longer a requirement for the learner to “have” knowledge in order to learn. There is only a requirement for the learner to know where to access the required knowledge to make it useful in their practical lives and applications. This theory changes the face of education, as there is too much information for learners to “know” when the thousands of available networks and connections are made across the internet. The learner who “wins” in this theory is the learner who is able to accurately access the needed information and translate it into practice (Downes, 2014).

There does not seem to be a clear role for the instructor in the connectivist theory, as much of the learning is guided by the available information on the problem, rather than the teacher or the learner. It seems that the role of the teacher may be to assist the learner with the creation of connections to better access information, and to assist with determining what information is trustworthy and which sources are better not to be trusted (Bates, 2015).

Connectivism applies directly to the approach used to create the online intervention, using an existing MOOC to access a platform on which the intervention can be built and maintained.

2.12.4. Multi-theory approach to adult education

Possibly the best way to view education of the adult learner is to see the learner at the centre of the learning experience, and the approaches to teaching and learning as possible solutions to the learner's needs. Adult learners are the sum of all the experiences, interactions, scaffolding and previous learning they have completed. They are also social beings who learn through social interaction and application of learning in a practical setting.

Taylor and Hamdy (2013) proposed a multiple theory of learning that can be summarised in the following five stages:

In the first stage, the theory proposes that the adult learner will always present to a learning opportunity with existing knowledge and beliefs. In order to start the process of learning there must be a phase of "dissonance" that is created. This means the learner should be exposed to something that challenges their current knowledge or beliefs, thus creating a space for the learner to realise that they are lacking in the knowledge, skills or attitudes required to complete the task successfully. The learners should realise that they need to learn something more to be successful in the task, often this is where the student determines their personal learning outcomes (Taylor and Hamdy, 2013).

Through the dissonance phase the learner emerges into stage two: the "refinement" stage, where possible answers to the problems encountered are found through research, interaction with other learners or an intervention and tasks. Stage three follows with "organisation" where the learners can now start to structure their understanding based on the new information acquired. The scaffolding for this next layer of knowledge is built, and then fleshed out by testing the concepts to make sure the new knowledge is embedded.

The fourth: "feedback phase" then follows where the learner is able to feedback new learning to be assessed by others. Good feedback will reinforce the understanding built, and negative feedback will lead back to a return to the organisation phase until feedback is positive.

The final stage is consolidation where the learner reflects on the process of the learning and knowledge, skills or attitudes that changed or were acquired (Taylor and Hamdy, 2013).

The development of an online intervention for learning about recognition and reporting of infant abuse covers the first three of these proposed phases, in that a state of dissonance may be created through interaction with challenging cases and questions. The refinement stage allows the student access to content and activities that will meet the needs identified by the case scenarios. The organisation stage is started at the end of the intervention, as the new learning can be made practical and implemented in real life.

2.13 Use of an online intervention for education

When it comes to changing attitudes and improving knowledge, a learning intervention is a commonly employed device (Johnson, Doecke, Damarell, and Grantham, 2018).

Prehospital emergency care providers are adult learners, with busy work environments and minimal time off; they work in shifts and often cover night shifts as part of their normal work hours. Due to the fact that access to these providers is difficult due to geographical location and spread, limited time off and the need for rest in their time off, the decision was made to create an online educational intervention to meet the educational needs discovered in the initial questionnaire.

When training is provided to the adult learner, it must be student centred and meet the needs of the student. It should be useable in their environments and transferrable through different experiences. Online learning meets this requirement, in that it can be completed in the student's own time, at their own pace, and is flexible from a commitment point of view, it can be completed during work hours or after work hours. It can also be done from anywhere in the world. (Paranel, Thomas and Derrick, 2012).

Further education can be expensive both in terms of time and man hours, especially in a situation where the majority of the staff in the setting work shifts and are not always available for contact time (Paranel, et al., 2012). Programmes that are offered for staff in

the prehospital environment must be freely available to these learners, easily accessible as well as cost efficient. Programmes must be available to the learner when the learner wants to access the information.

A web-based training system meets the above requirements: they can allow for a reduced cost of training, the training is available to a wide audience, online systems can reduce time requirements for the learning; rostering challenges presented by face to face training are eliminated (Paranel, et al., 2012). Online courses also mean that there is no travel requirement from those undergoing the learning, and this decreases time away from work.

In the medical world, the use of blogs and podcasts have been shown to increase the interaction of learners with content and increase the promotion of publications. There is some evidence that interaction with blogs and podcasts can increase knowledge around various topics as well as improve how information is communicated and spread to the greater environment (Narula et al, 2012).

Access to an online lesson allows adult learners to direct their own study and apply as much time as required to each topic for understanding (Taylor and Hamdy, 2013). In a study with lay-people, mothers exposed to materials about crying and how to avoid shaking their babies immediately after the delivery of the baby (within a few days) were found to be 1.7 times more likely to adopt the behaviours presented in the educational programme than mothers who were not exposed to the educational materials (Barr, et al., 2009).

Where respondents received more teaching in the topic of assessing, recognising and reporting of abuse, there was an increase in the knowledge and confidence of those providers (Johnson, et al., 2018). Those who had received teaching were better able to recognise themselves as mandated reporters and were much more likely to follow the correct procedural steps to make sure that the report was properly completed and received (Johnson, et al., 2018).

Similar studies that have assessed the effect of an online intervention for teaching in similar settings reported the following:

Most users felt online programmes were an effective and useful tool to deliver the kind of learning they were looking for; online programmes helped with sensitive topics as people were more comfortable to engage with difficult material in a private and non-threatening environment, without the pressure of having to engage with other learners about difficult topics (Paranel, et al., 2012). Online material was reportedly easy to interact with it was easier to complete what was required in their own time and pace (Paranel, et al., 2012). There is evidence to suggest that if the information presented to a learner is relevant, then it will be adopted and used in future interaction (Palis and Quiros, 2014).

A challenge with education around this topic is the infrequency of exposure to the abused infant. A possible answer to this dilemma is to increase the amount of teaching in this topic. Continuing education on the topic may improve results when respondents are exposed to the topic frequently. Johnson, et al., (2018) found that frequent exposure to the topic enhanced understanding, and increased comfort in the recognition and reporting of abuse in the child and infant. Frequent exposure to information about a topic, spaced over time, with repeat exposure at intervals, might increase the retention of knowledge (Cheng, Nadkarni, Mancini, Hunt, Sinz, Merchant, Donoghue, Duff, Eppich, Auerbach, Bigham, Blewer, Chan and Bhanji, 2018). The term for this method of learning is “spaced repetition”. Most of the information available about spaced learning refers to the way in which the information is retrieved (Fiske and Kang, 2016).

When information is retrieved from its “storage” area frequently, the ability to access the information improves each time. Interaction with an online intervention, every few weeks to months, should increase the ability of the student to access the stored information (Cheng, et al. 2018). It is hypothesized that the respondent who interacts with the online intervention will know more about how to apply the knowledge, will have a better understanding of the laws with regard to the reporting of abuse in infants, and will be more likely to report suspicious cases of abuse to the appropriate authorities.

The optimal frequency for spaced repetition learning is not known, but what is known is that the more information is retrieved, and applied, the easier it is for the student to draw on that information in the real environment (Fiske and Kang.2016). This is the basis on which the online intervention, developed in this study, was created, and why it was created to be open access, available at any time to the learner to refresh or read through and interact with as often as desired.

A concept that is important in the design of material for a learning intervention, is the applicability of the information presented. The learner would need to find the information relevant and applicable in their daily practice for the information to have value (Cheng, et al. 2018). Learning that adds value to a work environment is more likely to be used, interacted with and adopted (Kapur, S, 2015). A learning intervention must be easily accessible, in a media that suits the learner, and for the learner who is actively on duty, the information must be easy to open and close as needed. They should be able to pick up easily where they previously left off and access the learning with as little effort as possible (for example: limit login requirements, not needing to start from scratch each time they take a break).

An educational intervention can influence behaviour and attitudes about infant abuse and its recognition and reporting (Johnson, et al., 2018). This can be extrapolated to the prehospital care provider where an educational intervention may change attitudes and behaviour about the reporting of abuse, if aware of how to go about acting differently.

It can be seen that an online intervention meets the following requirements:

- Sense of autonomy in a free and easy to navigate system
- Information presented must be relevant (this can be achieved by using case studies from the practical environment and asking the learners to interact with them realistically)
- Assume prior knowledge on the topic, and allow for new knowledge to be constructed on the scaffolding already in place
- Allow the student to be active and interactive to engage fully. The online intervention is able to provide different media including pictures, videos, written

notes, podcasts and interactive quizzes to meet the active engagement requirement.

2.14 Summary

Infant abuse is a world-wide problem. It is difficult to recognise for several clinical and psychological reasons relating to the infant's physiology and presentation. Infant abuse is difficult to deal with in the prehospital environment as there is not a lot of information available to the provider on the topic, and the cases are not as commonly recognised as they should be. Infant abuse is difficult to approach with parents or caregivers in the prehospital setting and often if recognised, is not actively reported or dealt with.

Prehospital care providers report that they do not feel adequately prepared or educated to deal appropriately with abuse in their setting and are not always comfortable with reporting procedures or laws that exist for the reporting of abuse in the infant population.

There is a clear need for education on the topic, and some evidence that education in this field could be provided through access to an online intervention. Education about recognition and the reporting process might empower prehospital emergency care providers to be better able to recognise abuse in their setting, as well as equip them with the knowledge required to report abuse to the correct authorities.

CHAPTER 3: METHODOLOGY

3.1 Introduction

This chapter describes the methodology of the study. It includes information on each part of the study as it was conducted. Information about how the questionnaire was constructed and tested is presented along with information about the construction and publication of the online educational intervention. Ethical considerations have been explored, and the methods used for data analysis and management of data are discussed.

3.2 Study design

The study was conducted as a need's analysis, with the development of a questionnaire to determine the knowledge, skills and attitudes of prehospital care providers with regard to the recognition and reporting of cases of infant abuse in the prehospital environment. This research method was used as it allows for the estimation of the needs of a group of people. A needs analysis allows the researcher to collect information about the current situation and the current skills and knowledge about a particular topic or problem (Polit and Beck, 2017). It was appropriate for this study as the researcher required a snapshot in time of the problem, in order to create an online intervention that may assist in solving the problem.

The study was designed in two parts:

Part 1: development of the questionnaire. A cross-sectional analysis of the knowledge, attitudes and skills of the emergency care provider in the case of the physically abused infant was determined through a self-developed questionnaire.

Part 2: The development of an educational intervention programme to address the needs identified in part 1.

This online intervention was developed through interaction with the findings from the first part of the study. Needs were identified through the responses to the different questions and case studies. An online programme was developed to meet the needs identified.

3.3 Study population and sample

The population for this study included prehospital care providers who were currently operational (working in the clinical environment) in South Africa. Any emergency care provider who met the inclusion criteria was invited through social media platforms and at the listed conferences to participate in the study.

3.3.1 Inclusion criteria

Prehospital care providers who are allowed to operate within the borders of South Africa as independent providers (see Operational Definitions for the description of these providers in section 1.6). These staff were invited to participate through numerous forums and face to face interactions.

Registration with the HPCSA was taken at face value as there was no method of assessment of the responses returned due to anonymity in the study.

3.3.2 Exclusion criteria

Originally the exclusion criterion for this study was providers who were not operational for more than 160 hours per month. This criterion had to be changed when the calculated response rate could not be achieved. As a result, all completed questionnaires were accepted and the incomplete questionnaires were excluded.

3.4 Sample

Given that the sample was collected using social media and conference attendance, convenience sampling was implemented.

3.5 Data collection tools

3.5.1 Structure of the Study

An online questionnaire was developed as no existing tool could be found. The questionnaire consisted of three sections (See Appendix D).

Section 1: Demographic data

Section 2: The questions posed in this section aimed to determine the attitudes of respondents toward the recognition and reporting of infant abuse. Respondents were also asked to rate their knowledge about the law with regard to abuse in South Africa. Knowledge about the laws and rules of reporting was also probed.

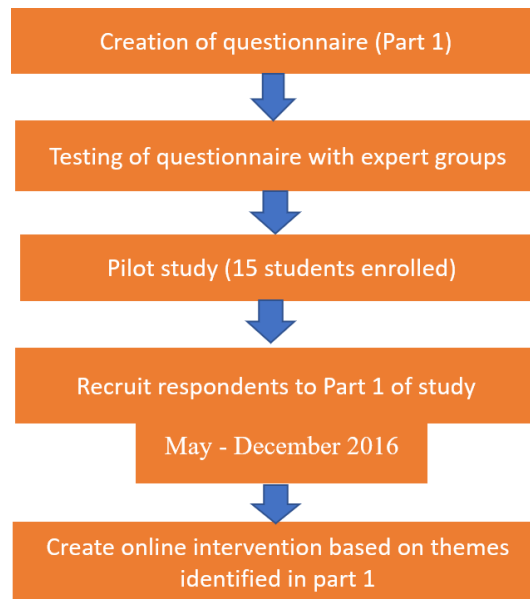
Section 3: This section contained case studies that tested the actual knowledge about infant abuse recognition and reporting in South Africa, and skills in applying the knowledge (as defined in the operational definitions).

The questionnaire was then refined by two processes:

- Face validity assessment using two expert groups (See Appendix E)
- A pilot study to test the usability of the online system

This section discusses each of these processes and is summarised in Figure 3.1 below.

Fig 3.1: Flow diagram of the timeline of the study



3.5.2 Part 1: Construction of the data collection tool

As there were no pre-existing tools for the type of data required in this study, the questionnaire was developed by the researcher in consultation with, and input from an expert group (the Shaken and Abused Baby Initiative -SAABI) based at the Teddy Bear Clinic at the CMJAH.

The questionnaire constructed consisted of three sections.

The first section of the questionnaire included demographic information about the respondent. The demographic information requested included data on the respondent's age, qualification, gender, years of experience in the field, years of experience at current qualification level, hours worked in the clinical environment per month and whether they worked in a private or government setting. The second section of the questionnaire sought to determine the respondent's perceived knowledge about infant abuse in the prehospital setting, and the attitudes of the respondent toward infant abuse. This section

used direct questions with both binary options and Likert scale answers.

The third section of the questionnaire presented cases for interpretation with some questions requiring binary answers, and some requiring justification for the answers provided. The cases were created to test applied knowledge (defined as “skills” in the operational definitions.) The questionnaire can be found in Appendix D and is the final questionnaire that was used in the study, after being reviewed and corrected by the expert panel and educator group.

Respondents completed the questionnaire online. No personal identifying data were recorded on the questionnaire.

The questionnaire (part 1 of the study) aimed to determine the knowledge of the emergency care provider about the recognition of the infant at risk/suspected of having suffered abuse based on accepted risk factors, clinical findings and elements of the history, knowledge with regard to the legal requirements and protection of the emergency care provider. The attitude of the emergency care provider toward the reporting of suspected child abuse was assessed through open-ended questions and Likert-scale items indicating willingness to report and barriers to the reporting of a case of infant abuse in South Africa.

3.5.3 Validity and reliability

Face validity of the questionnaire was determined through the expert group at the Teddy-Bear clinic and the Emergency Medicine teachers at the private education facility. Teachers were asked to scrutinise the questions and determine any ambiguity in the questions, and then describe what the question was asking to ensure that the question targeted the information required.

Their feedback was summarised and can be found in Appendix E. Corrections to the questionnaire were then made to best reflect the questions being asked, and ambiguous questions or phrases were removed or changed.

The questionnaire was then piloted online with 15 respondents. The pilot study aimed to determine if the questionnaire was clear and simple to understand. The electronic data capture system was trialled at the same time to ensure usability and functionality.

The respondents in the pilot study were student volunteers from a private prehospital training facility in South Africa. These learners were registered with the HPCSA as Ambulance Emergency Assistants and were studying towards their Critical Care Assistant qualification at the time. This placed them within the same skill and knowledge level as the intended study sample, and as they were not able to participate in the study (due to their relationship as students to the researcher), meant no decrease in available respondents for part one of the study. At the time of the pilot study, these learners were enrolled in the practical phase of their studies, meaning that they spent no less than 160 hours per month in the clinical environment (either in prehospital road operations, or in hospitals).

Feedback from the pilot study was positive with very little constructive feedback received regarding the use of the questionnaire and the case study length. All 15 respondents in the pilot group completed the questionnaire. The respondents reported the questionnaire to be accessible and did not experience any problems with the electronic systems and reported no problems in question interpretation.

3.5.4 Part 2: Online Educational Programme

The educational programme was developed based on the findings of the questionnaire and addressed the requirements for recognition and reporting of infant abuse cases, as well as gaps in knowledge, skills and attitudes identified through part 1 of the study.

These gaps were in line with other studies that addressed the need for such teaching in the prehospital environment. South African specific information about the laws in place for the protection of children and reporting of abuse were referenced in the intervention, to ensure applicability for the South African practitioner.

The major gaps identified in the first part of the study included physical assessment of the patient and clinical history as well as the actual laws for the reporting of abuse in the prehospital environment.

The reporting of cases of suspected abuse was determined in all the cases, with an emphasis on reporting the infant patient who had died because of suspicious circumstances. The trend in all the cases (except those that were obvious cases without the hidden nuances) was that not all practitioners noted the need to report the case. These points were highlighted as needs for the learning intervention.

3.6 Data collection process

3.6.1 Part 1: The Questionnaire

Respondents were recruited through interaction at three conferences and Emergency Care Symposia which occurred in 2016 and 2017 (a list of these can be found in Appendix C). A link to the questionnaire was also distributed via email (using existing databases of advanced prehospital care providers) (See appendix C) and social media (Facebook groups and Twitter). More information about these conferences, and the ALS database used to invite participants can be found in Appendix C.

The questionnaire (which can be found in Appendix D) was expected to take no more

than 30 minutes to complete, based on the researcher's attempt and through the pilot study results, although it appeared that some respondents spent more time on the questions.

Access to the questionnaire was available for function on any device, from smart phones to a desktop computer. All platforms used in the creation of the questionnaire and the development of the educational intervention were adapted to the format required.

3.6.2 Part 2: Online learning programme

Based on the findings and needs identified in part 1, an online education programme was developed. A curriculum for the recognition, management and reporting of abuse in the infant population was created with emphasis on the needs determined by Part 1 (the questionnaire) of the study.

The intervention appeared online through a system called "Fedora". This web platform is an open source, free platform which allows for the creation of free online content, and the ability to track student movement through the online learning activity. The Fedora platform allows for the creation of open access learning modules and requires only simple log-in.

The intervention can be found at: <https://netcare-education-fecc.usefedora.com/courses/enrolled/147251>

An outline of the programme can be found in Appendix F, as well as some of the tools that are available for the student to use. The content is best viewed in the online forum.

The programme was created in the form of a blog. It is written in a conversational tone and provides the learner access to information beyond the content on the platform. The platform provides links to relevant video or other resources and allows students to access information that adds to their overall knowledge and experience.

The online intervention is open access and is available to any health care provider who is willing to work through the content.

Approach to creation of the online intervention

The online intervention was based on Knowles' theory of learning. The intervention was based on the assumption that the adult learner looks for an experience of growth in learning. It was also assumed that the respondents in this study would have been self-motivated and wanted to engage with the material and concepts. The respondents who enrolled in the online intervention were considered to be ready to learn, as through interaction with the questions and cases in the questionnaire they had completed, the assumption was that the respondent was seeking some resource to correct what they may have incorrectly answered in the questionnaire.

The constructivist theory of learning was employed. The respondent was expected to interact with the material presented in the learning programme. The respondents were asked to reflect on the videos presented and place themselves in the situation as the first responder to the scene. They were asked to think about the information they would need to witness and report if they were to interact with the patients in the cases presented.

In addition to a constructivist approach, connectivism was also employed. A repository of information was developed. This provides a resource for respondents to use at any time after interaction with the online intervention.

Respondents were assumed to commence the programme with prior knowledge. The prior knowledge which was expected to be in place was summarised in a short opening section. The objectives of the learning intervention are met through short interactions. These interactions were designed to trigger thought about abuse in the respondents' own prehospital spaces.

The outcomes of the online intervention are described below:

- Recognition that the infant patient is at high risk of possible abuse
- List and explain the possible "sentinel injuries" related to possible abuse in the infant patient

- Recognise a case of abuse from the presentation and clinical signs and symptoms (using sentinel injuries to assist in the diagnosis of possible abuse)
- Recognise that the death of an infant in a prehospital setting is suspicious; the death must be reported with a request for autopsy.

The online intervention was created to meet the needs of the basic and advanced provider in the prehospital setting. The programme commences with an introduction to the information that will be covered. Use is made of conversational language and a WHO approved infographic to present an introduction to abuse in the paediatric population.

The learning topics were created to be short and interesting with as little reading as possible, in order to maintain a high level of interest. Infographics and diagrams have been used to describe information, such as the extent of the problem in South Africa and why infants are at such high risk. In order to stress the importance of the information being covered, attempts were made to apply the information to the prehospital environment as often as possible.

The recognition of possible abuse in infants is difficult to detect and for this reason a number of infographics and videos have been used. Sentinel injuries and red flag injuries are described, and images have been included to allow the respondents to interact with real life examples.

An affronting video of a child who was abused by a caregiver has been included. This video is not for sensitive viewers but indicates the possible events prior to the arrival of the prehospital emergency care provider on the scene. This is important as prehospital care providers often arrive on the scene to witness a lethargic or ill child, who because of their physical characteristics, may not demonstrate the physical signs of abuse thought to be common. The emergency care responders are not always able to easily recognise the severity of the injury inflicted.

A printable report form and question tool is included for the respondent to use, should it ever be necessary to report on a case of possible abuse. The tool details the possible differential diagnoses that might be used in defence of the injury found at a later date,

and could be used as a medicolegal document in the case that the reported abuse is brought before a court and the provider is required to provide detailed information on their findings at the time. (This resource has been included as appendix F)

A list of the appropriate resources to contact in the event of a case of abuse needing to be reported has been included in the resource list. Such a resource is time saving in that direct contact details are provided.

3.7 Data management and storage

The questionnaire data were collected through the Wits Health Sciences, Lime-survey collection tool. The information was collected and stored online and exported from the online system into excel files that could be used for data analysis. The Lime-survey system is a password protected access system to which only the author had access.

Data were stored in a pass-word controlled cloud-based site to protect against loss of data.

3.8 Ethical considerations

Data collection only commenced once the study was approved by the University of the Witwatersrand's Human Research Ethics Committee (Clearance certificate No: M160413) (see Appendix G) and Postgraduate Studies Committee.

Respondent information letters detailing the research procedure (See Appendix H), purpose and risks of the study were made available on the link created for the questionnaire. Confirmation that the respondent understood the information contained was gained by a checkbox for respondents to mark. Completion and submission of the online questionnaire was taken as willingness and consent to participate in the study.

The respondents were made aware that they could withdraw from the study at any time, before the questionnaire was submitted. Once submitted, the questionnaire was anonymous and thus the researcher was unable to identify the results of specific

respondents. The respondent was made aware that there were no penalties or consequences for withdrawing from the study.

The respondents in this study were not considered to be “at risk” groups, however, there was a chance that the respondent could experience discomfort due to the nature of the information taught in the intervention and the questions asked in the questionnaires. A distress protocol was developed for the respondent who was unable to participate further in the case of distress, emotional trauma or concern. All respondents of the study were given the contact information of a clinical psychologist who volunteered to assist in the study should any of the respondents need assistance. Details can be found in Appendix I. None of the respondents contacted her in the study period.

3.9 Data analysis

Demographic data were analysed using descriptive statistics. The statistics programme *Statistica (version 12)* was used to analyse the data collected. Graphs and tables were used to report the data collected.

3.10 Conclusion

The methodology of the study was discussed with special emphasis on the creation and testing of the data collection tool. The development of the online programme has been outlined and described, with reference to the tools used to present the information in an online format. The ethical considerations for this study have been detailed, and management of data has been explained.

CHAPTER 4: RESULTS

4.1 Introduction

This chapter presents the results of the study. It includes the demographic information collected, the knowledge and attitudes of the respondents toward infant abuse in the prehospital setting and the ability of the respondents to recognise elements of the history and clinical findings that lead to a suspicion of infant abuse.

Data were collected from May 2016 through to December 2016. A total of 71 respondents completed the questionnaire.

It was estimated that the questionnaire should have taken 30 minutes to complete. However, the average time for completion of the questionnaire was 47 minutes, with the greatest time being 229 minutes (almost 4 hours).

The data has been reported under the following major heading:

The demographic findings reflect the number of respondents, their ages, level of qualification, the number of infants seen on a monthly basis and years of experience.

Respondents' knowledge was determined through responses to questions 23-30. These questions mainly related to knowledge of the law and the need to report abuse. In all the scenarios a question was included that related to the need to report the case.

Skills were assessed in all the case studies, through question A. This question asked the respondent if they were concerned about the presentation as possible abuse. This question sought to test the application of the respondents' knowledge about abuse, and whether they could identify a situation that was high risk as compared to others that may be low risk.

The attitudes of the respondents were assessed through question 10, 15-17 and 12-23. These questions attempted to assess if the respondent was comfortable with the need to report and their attitude toward the recognition and reporting of abuse. The final question

in each case study allowed the respondent to make a comment as to why they were concerned about the case as possible abuse or not. This allowed insight into the thought process of the respondent, and so assessed attitude, skill and knowledge of the respondent in each case scenario. As attitude is related to the ability to recognise and the knowledge to recognise abuse, it cannot easily be drawn out and reported as an individual idea in all the areas. Where this domain was assessed in a single question, it has been reported as a reflection of the attitude of the respondents.

4.2 Demographic Results

The tables that follow, summarise the demographic data of the respondents.

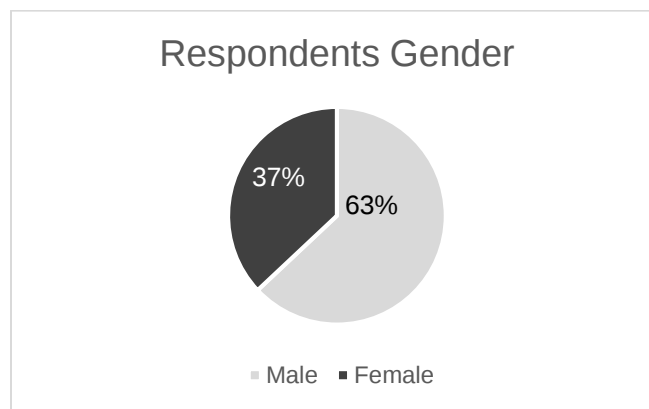


Fig 4.1: Gender of respondents (N=71)

Most (63%) of the respondents in the study were male. This is consistent with the reported statistics from the HPCSA (2015). Most of the practitioners registered with the HPCSA in South Africa (in the categories of ANA, ANT, ECP or ECT) are male (70%) (HPCSA, 2018). Information on the country wide demographics of the South African prehospital staff can be found in Appendix J.

Table 4.1: Age of the respondents

Age	(n = 71)
<i>18 - 25 years old</i>	11 (15%)
<i>26 - 35 years old</i>	43 (61%)
<i>36 - 45 years old</i>	11 (15%)
<i>46 - 55 years old</i>	5 (8%)
<i>56 - 65 years old</i>	0
<i>Not Answered</i>	1 (1%)

The respondents' ages were generally aligned with the national demographics represented by the HPCSA annual report (2015). The sample group enrolled in this study represented a slightly younger group of practitioners who make up the national average.

Table 4.2: Qualifications of the respondents (n = 71)

Qualification	Total	Percentage
Master's Degree in Emergency Medical Care (ECP)	2	3%
Bachelor's Degree Emergency Care (ECP)	10	14%
National Diploma Emergency Care (ANT)	1	1%
Emergency Care Technician (ECT)	8	11%
Ambulance Emergency Assistant (ANA)	26	37%
Critical Care Assistant (ANT)	24	34%
Total	71	100%

The majority of the practitioners in this study were Ambulance Emergency Assistants (enrolled on the ANA register). The representation of Ambulance Emergency Assistants

enrolled in the study were less than the percentage represented by the population studied. The ANT practitioners are over-represented in this study (based on the percentage of CCA qualified pre-hospital emergency care providers present in the population). As a result, the findings may be skewed to reflect the Critical Care Assistants' abilities and attitudes.

Table 4.3: Years of experience in the field of emergency care of respondents (n=71)

Year of Experience in the field	Total	Percentage
0 – 4 years	17	24%
5 – 8 years	15	21%
9 – 15 years	29	41%
16 – 20 years	10	14%
Total	71	100%

Most of the respondents enrolled in the study had been exposed to the field of emergency care for 9-15 years, with just under a quarter of the respondents being new in the field of Emergency Care with less than 4 years of experience in the field (see Table 4.4).

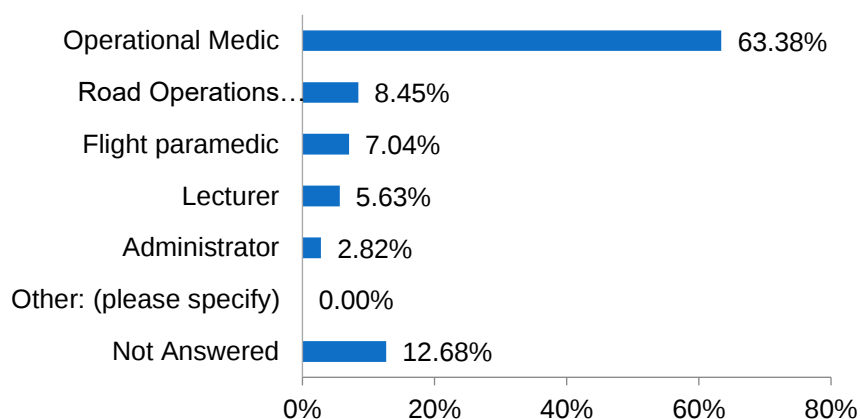


Fig 4.2: Job title of respondents (n=71)

Most of the respondents enrolled in the study were employed as full-time operational medics which means that their primary job involved clinical interaction in the pre-hospital environment. Operational medics are the first-line entry point into the healthcare system for many infants, including the abused infant and their family or caretakers (See Fig 4.2).

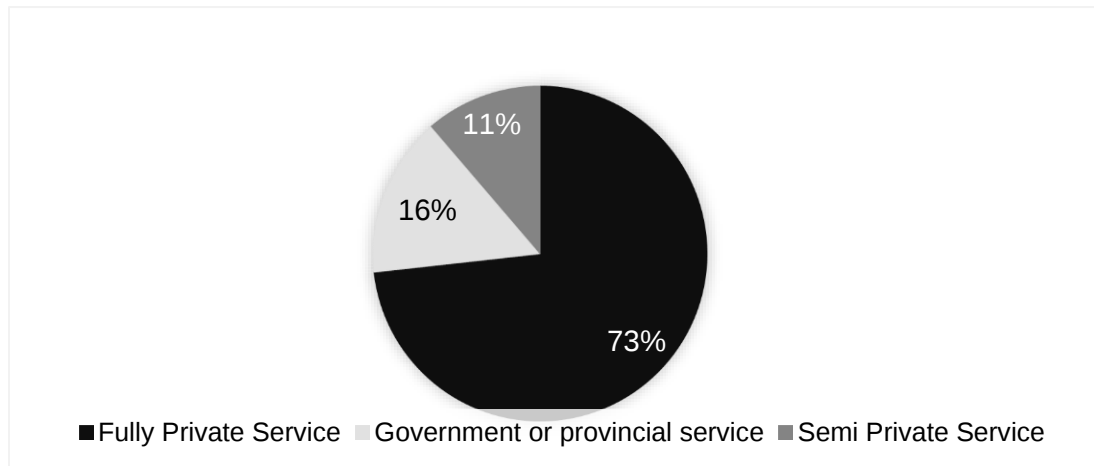


Fig 4.3: Area of service in which respondents worked (n=71)

Most of the respondents (73%) worked in a private emergency medical service (See Fig 4.3). This is not representative of the demographics of the practitioners working within the South African setting. This value may have been skewed by the area in which the researcher worked at the time of the study.

The number of hours worked per month was in line with the expectation of the researcher, with most respondents working the number of hours approved by the department of labour (160-200 contracted hours per month with additional overtime optional) (See Fig 4.4). This means that most of the practitioners who completed the questionnaire were interacting in the patient environment for at least 15 days a month (15 shifts per month) and may even have been interacting in the environment up to 23 shifts per calendar month. Even at 50 hours a month of clinical work, the practitioner in the pre-hospital environment did at least 2-3 shifts in a month.

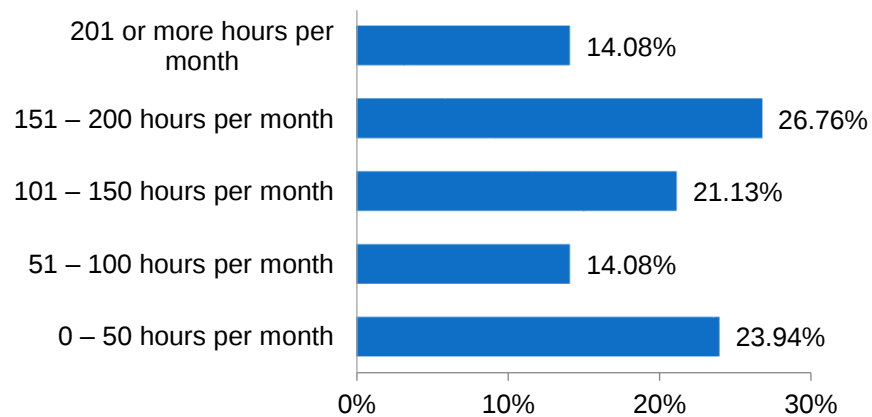


Fig 4.4: Number of hours worked per month by respondents

Respondents were asked to estimate the number of infants that they saw on average in their practice in a single month. This figure is self-reported and is not based on any external data, and therefore cannot be verified within the scope of the study. Most of the respondents (62%) saw at most two infants a month in their practice. This means that on average, the respondent would see approximately 24 infants within a 12-month period, increasing the risk of not being able to recognise signs of abuse that may be obvious to a practitioner who sees infants daily. This finding may indicate that ongoing development to maintain knowledge is warranted in a group who are *required* to recognise and report infant abuse, but who see so few infants as to make them “inexperienced” with this age group. There were some practitioners who saw more than 12 infants in a month. These practitioners are well poised to make a difference in the case of infant abuse but would be required to recognise the signs as well as know how to go about reporting in order to make a difference for these children.

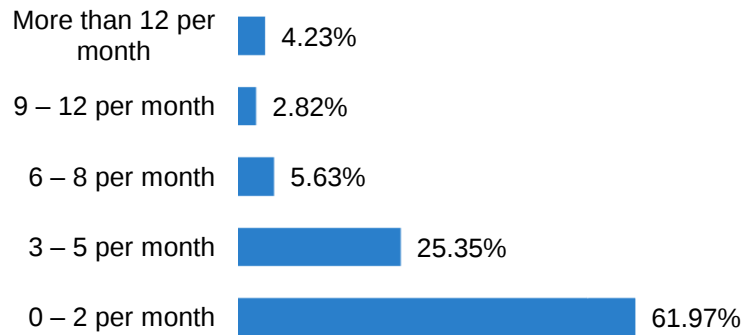


Fig 4.5: Self-reported number of infants transported (n=71)

Table 4.4 below references those practitioners who see more than three infants in a month, and their self-reported ability to recognise abuse.

Table 4.4: Number of infants seen per month and reported ability to recognise abuse (n =71)

	Infants seen per month				
	< 2 (n = 44)	3 - 5 (n = 18)	7 - 8 (n = 4)	9 - 12 (n = 2)	> 12 (n = 3)
Comfortable to recognise abuse?	73%	83%	100%	100%	67%

Only three of the 71 respondents saw more than 12 infants in a month, and one of those three was not comfortable in recognising the signs of abuse in an infant. Of those who saw <2 infants per month, 32 (73%) felt they were comfortable in recognising signs of abuse, while 27% were not comfortable. Respondents in this study reported they would be comfortable to recognise abuse. This will be considered in relation to their actual ability to recognise abuse. Regarding actual ability to recognise abuse in the infant population, there was little difference between those who saw several infants and those who saw fewer infants.

4.3 Attitudes towards and knowledge of infant abuse and the reporting of abuse

The questions that report on the attitudes towards and knowledge of reporting of abuse in the infant population are represented by questions 10-30 in the questionnaire.

The information is presented under the following sub- headings:

1. Self-reported comfort with recognition of abuse (based on elements in the clinical assessment and history): represented by questions 10, 19-23
2. Participation in any training on the topic of recognition and reporting of child abuse: represented by questions 11 and 12
3. Self-reported knowledge of recognition and reporting of abuse in the infant population: represented by questions 13-18
4. Self-reported knowledge about South African law for the reporting of abuse in children: represented by questions 24-30

4.3.1 Self-Reported comfort with recognition of abuse in infants

These findings reflect the attitudes of respondents to the recognition and reporting of abuse. (Refer to the operational definition, page 6.

Respondents were asked if they felt comfortable in recognising a case of infant abuse from clinical signs and symptoms as well as elements in the history. Most of the respondents (n = 55; 77%) stated that they did feel comfortable recognising a case of infant abuse.

Years of experience did not seem to affect the self-reported comfort of the respondents in recognising abuse. In contrast, the length of the educational programme completed, seemed to contribute to confidence in recognising abuse. The respondents who had completed a longer programme reported being more comfortable in recognising abuse than those who attended the shorter training programme of the Ambulance Emergency Assistant Course (registered as ANA practitioners). There were too few national diploma

and master's graduates to comment on the on the comfort of these individuals in recognising abuse.

More important that the self-reported comfort with recognition, is the ability to recognise the signs of abuse. Often the ability to complete a skill or apply knowledge is lower than the perceived ability (Katowa-Mukwato and Banda, 2016).

Due to the nature of the problem, and the high-risk environments that abused infants live in, the requirement is for the independent prehospital care provider to be sure of which patients meet the requirements for mandatory reporting. There should be no margin of error for recognition of abuse in the infant population. The prehospital emergency providers should be able to recognise the signs and should be able to recognise when they need to report these cases. Not recognising, and not reporting possible cases of abuse have been associated with increased mortality for infants in abusive situations.

Table 4.5: Self-reported comfort of respondents in recognising infant abuse based on clinical findings and history, comparing age, experience and job titles (n = 71)

<i>Total Years' Experience</i>	Comfortable in recognising abuse	Not comfortable in recognising abuse
0 – 4 years (n = 17)	13 (76%)	4 (24%)
5 – 8 years (n = 16)	12 (75%)	3 (25%)
9 – 15 years (n = 29)	21 (72%)	8 (28%)
16 – 20 years (n = 10)	9 (90%)	1 (10%)
<i>Qualification</i>	Comfortable in recognising abuse	Not comfortable in recognising abuse
Ambulance Emergency Assistant (n = 26)	18 (69%)	8 (31%)
Emergency Care Technician (n = 8)	7 (88%)	1 (12%)
Critical Care Assistant (n = 24)	21 (88%)	3 (12%)
National Diploma in EMC (n = 1)	1 (100%)	0
Bachelor's Degree in EMC (n = 10)	7 (70%)	3 (30%)
Master's Degree in EMC (n = 2)	1 (50%)	1 (50%)
<i>Age</i>	Comfortable in recognising abuse	Not comfortable in recognising abuse
18 - 25 years old (n = 11)	8 (73%)	3 (27%)
26 – 35 years old (n = 43)	32 (74%)	11 (26%)
36 - 45 years old (n = 11)	9 (82%)	2 (18%)
46 – 55 years old (n = 5)	5 (100%)	0
Age not selected (n = 1)	1 (100%)	0

Table 4.6 below shows the findings that compare self-reported ability to recognise, and actual ability to recognise abuse in the pre-hospital setting, based on the information collected in the clinical scenarios of the questionnaire.

Table 4.6: Self-reported ability to recognise abuse compared to actual ability to recognise abuse (n=55)

	Concerned about possible abuse (Question 1 of each case study)	Would report (Representing question 2 of each case study)	Not sure if needed to report (Representing question 2 of each case study)	Researcher and expert group's recommendation regarding requirement to report in this case?
Case 1	17 (31%)	6 (11%)	10 (18%)	Not required
Case 2	13 (24%)	6 (11%)	10 (18%)	Not required
Case 3	54 (98%)	44 (80%)	9 (16%)	Mandatory
Case 4	55 (100%)	52 (95%)	2 (5%)	Mandatory
Case 5	46 (84%)	39 (71%)	7 (13%)	Mandatory

Table 4.6 reflects only those who reported comfort in recognising abuse (n =55). Cases 1 and 2 had no elements of concerning findings for abuse. Although all the respondents above felt they were able to recognise a case of abuse from the history and clinical presentation, 31% of the respondents in case 1 were still concerned that this case was possible abuse, and of the 55 who reported that they were able to determine abuse, 10 (18%) were not sure if they needed to report this case or case 2.

Actual ability to recognise the case of abuse is considered a skill (Refer to operational definition - page 6.

Cases 3 - 4 were clear cases of possible abuse based on the clinical findings and history elements. These were mostly recognised as such, however, when asked if they needed to be reported, 11 respondents were unsure. This shows that even though respondents managed to recognise abuse, they were not able to translate that into a recognition of the need to report that abuse.

Case 5 was a clearly suspicious case, which needed to be investigated as the infant died suddenly. This case asked a further question about whether the case should be reported for autopsy. Although 84% of the respondents were concerned about the presentation, only 71% suggested they would report this as a case of possible abuse, and 89% of the 55 who were confident in recognising abuse suggested the case be reported for post-

mortem investigation. Despite the fact that all the respondents reported that they were able to identify abuse, for case 5 only 84% of respondents were actually able to identify signs of possible abuse.

Questions 13 and 14 asked the respondents to rate their knowledge of recognising abuse in the infant patient based on clinical information as well as history presented. This separated out the two major areas for assessment that can be used to recognise signs of abuse in the infant patient.

Just over half of the respondents (53%) felt that they agreed with the statement “I feel comfortable that I have enough knowledge about the clinical presentation and manifestations of child abuse in the infant population to make a differential diagnosis of abuse”. Almost half of the respondents, 33 of the 71 (47%) respondents felt neutral about this statement or disagreed with it.

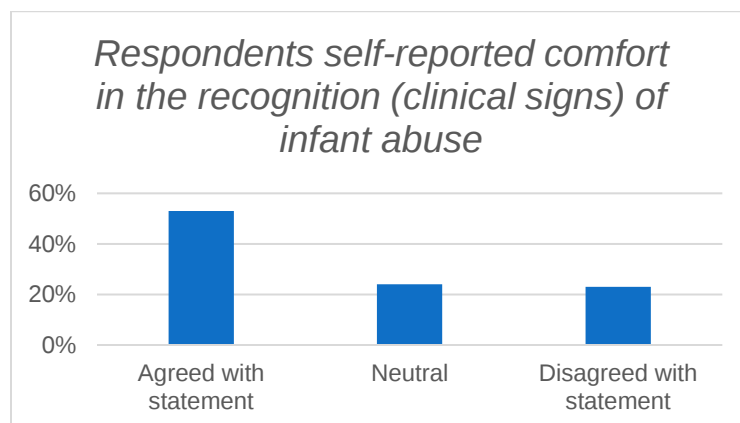


Fig 4.6: Respondents self-reported comfort in the recognition (clinical signs) of infant abuse (n=71).

Table 4.7: Respondents self-reported comfort in recognition (clinical signs) of infant abuse compared to age, qualification and years of experience (n = 71)

Age	Agree with statement	Neutral	Disagree with statement
18 - 25 years old (n = 11)	6 (54%)	2 (18%)	3 (27%)
26 – 35 years old (n = 43)	21 (48%)	11 (26%)	11 (26%)
36 - 45 years old (n = 11)	8 (73%)	2 (18%)	1 (9%)
46 – 55 years old (n = 5)	3 (60%)	2 (40%)	0
Age not selected (n = 1)	0	0	1 (100%)
Qualification	Agree with statement	Neutral	Disagree with statement
Ambulance Emergency Assistant (n = 26)	11 (42%)	7 (27%)	8 (31%)
Emergency Care Technician (n = 8)	6 (75%)	1 (12.5%)	1 (12.5%)
Critical Care Assistant (n = 24)	14 (58%)	8 (33%)	2 (9%)
National Diploma in EMC (n = 1)	0	1 (100%)	0
Bachelor's Degree in EMC (n = 10)	6 (60%)	0	4 (40%)
Master's Degree in EMC (n = 2)	1 (50%)	0	1 (50%)
Years of Experience (Total)	Agree with statement	Neutral	Disagree with statement
0 – 4 years (n = 17)	10 (59%)	5 (29%)	2 (12%)
5 – 8 years (n = 15)	7 (44%)	4 (25%)	4 (25%)
9 – 15 years (n = 29)	14 (48%)	7 (24%)	8 (28%)
16 – 20 years (n = 10)	7 (70%)	1 (10%)	2 (20%)

The age group of 26-35 years were the least comfortable in recognising abuse. This was a surprising finding as the youngest and older groups were more comfortable with their ability to recognise abuse. Those with less than four years' experience and those with

more than nine years' experience were also more confident in their abilities than the group with 5-8 years' experience. In terms of qualifications, the Emergency Care Technicians and those with a bachelor's degree in emergency medical care were more comfortable in recognising abuse than those with other qualifications, with the Critical Care Assistant also reporting positively to being able to recognise abuse. The groups who reported most comfort in the ability to recognise abuse are the groups who spend more time engaged in theoretical learning in the classroom, as well as more time engaged in supervised clinical practice. When the information above is compared for the different qualifications, it is evident that there is a problem at all levels of qualification.

Less than half of the respondents (45%) felt that they agreed with the statement "I feel comfortable that I have enough knowledge with regard to *the risk factors and history presentation* of abuse in the infant patient to make a differential diagnosis of abuse." Just over a quarter of the respondents (28%) felt neutral about this statement, and 27% of the respondents felt that they were not comfortable in recognising abuse based on the history and risk factors presented (See Fig 4.7). Table 4.8 below summarises the findings for this question.

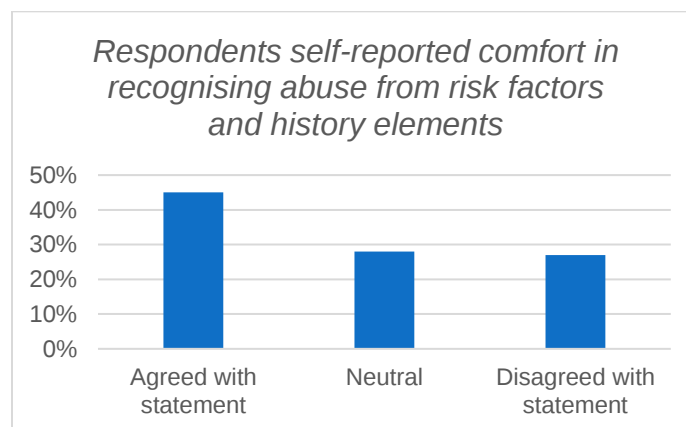


Fig 4.7: Respondents self-reported comfort in recognising abuse from risk factors and history elements

Table 4.8: Respondents self-reported ability to recognise infant abuse based on history, comparing qualification, age and years of experience (n = 71)

Age	Comfortable	Neutral	Not comfortable
18 - 25 years old (n = 11)	6 (54%)	3 (27%)	2 (18%)
26 – 35 years old (n = 43)	16 (37%)	14 (43%)	13 (30%)
36 - 45 years old (n = 11)	7 (63%)	1 (10%)	3 (27%)
46 – 55 years old (n = 5)	3 (60%)	2 (40%)	0
Age not selected (n = 1)	0	0	1 (100%)
Qualification	Comfortable	Neutral	Not comfortable
Ambulance Emergency Assistant (n = 26)	7 (27%)	8 (31%)	11 (42%)
Emergency Care Technician (n = 8)	6 (75%)	2 (25%)	0
Critical Care Assistant (n = 24)	14 (58%)	8 (33%)	2 (9%)
National Diploma in EMC (n = 1)	0	1 (100%)	0
Bachelor's Degree in EMC (n = 10)	4 (40%)	1 (10%)	5 (50%)
Master's Degree in EMC (n = 2)	1 (50%)	0	1 (50%)
Years of Experience (Total)	Comfortable	Neutral	Not comfortable
0 – 4 years (n = 17)	9 (53%)	5 (29%)	3 (18%)
5 – 8 years (n = 15)	7 (46%)	4 (27%)	4 (27%)
9 – 15 years (n = 29)	10 (34%)	10 (34%)	9 (31%)
16 – 20 years (n = 10)	6 (60%)	1 (10%)	3 (30%)

Self-reported comfort reflects attitudes towards recognition and reporting of infant abuse as defined by the operational definitions (See page 6).

Older practitioners were more comfortable in recognising abuse based on history, but it seems that years of experience didn't affect this level of comfort. Surprisingly the group with 9 – 15 years of experience reported being the least comfortable in the recognition of abuse from history features. Ambulance Emergency Assistants were the least comfortable recognising abuse from history features. This course is the shortest course of all the qualifications studied (they are the lowest qualification of all the independent practitioners in the field).

Recognising abuse from history and risk factors alone is challenging for all providers, and this table indicates that providers are more comfortable in determining whether an infant is being abused from the clinical presentation, than by relying on the history and risk factors alone. This was reflected in the case studies where cases that presented only a history and risk factors that put the infant at risk for abuse were not as well assessed as those with clinical and physical findings.

Questions 19 – 23 of the questionnaires considered respondents' willingness to report a case of suspected abuse, and previous reporting behaviour as well as whether the respondent considered a report would be followed up. These questions reflect the attitudes of the respondents towards the reporting of abuse (See operational definitions on page 6).

Table 4.9: Respondents willingness to report suspected abuse and previous reporting behaviour (n = 71)

Question	Yes	No	Unsure
Respondent would feel comfortable to report a case of suspected abuse (question 19)	66 (93%)	0	5 (7%)
Respondent previously reported a case of abuse against a child (question 20)	26 (37%)	45 (63%)	0
Respondent suspected abuse but did not report it (question 21)	7 (10%)	54 (76%)	10 (14%)
Respondent feels comfortable reporting child/infant abuse in their current place of work (question 22)	56 (79%)	8 (11%)	7 (10%)
Respondent believes a report of child abuse would be well received and followed up by authorities (question 23)	22 (31%)	11 (30%)	28 (39%)

Of concern are the seven responses (10%) of suspected abuse where the respondent had not reported the case and a further 10 (14%) who were unsure if they had needed to report the cases even though they may have suspected abuse. This finding represents the skill of the respondent. Although the knowledge of possible abuse was present, the skill in recognising that the case needed to be reported was not applied.

A concerning finding represented in the table above is the decrease in the number of respondents who believe a case of abuse would be well received and followed up by authorities. This was anticipated to be a finding of concern based on the literature review where several studies (Sanders and Cobley, 2005; Hendriks, 2014; Tiyyagura, et al, 2015) reported a reluctance to report cases based on the concern that nothing would come of the report and that nothing would be done to protect the child by the appropriate authorities.

4.3.2 Knowledge of the laws relating to reporting of abuse

Respondents were asked to answer a series of questions about the laws that pertain to the reporting of abuse. These questions tested the knowledge of the respondents regarding the “may” and “must” clauses of the Children’s Act 38 of 2005: Section 110 a and b. The questions that specifically looked at these laws were Questions 24-26 and 29-30. The results are shown in Tables 4.10.

The table below reflects knowledge of the respondents as defined on page 6.

Table 4.10: Responses to knowledge about the laws of reporting infant abuse (n = 71)

Question	Yes	No	Unsure
Are you required by law to report a suspicion of abuse (question 24)	60 (84%)	2 (3%)	9 (13%)
Only medical doctors are required by law to report a suspicion of abuse (question 25)	4 (6%)	57 (80%)	10 (14%)
Death of an infant in the pre-hospital environment should be reported (question 26)	60 (85%)	6 (8%)	5 (7%)
Failure to report a suspicion of abuse is in breach of the laws of South Africa (question 29)	51 (72%)	3 (4%)	17 (24%)
Failure to report evidence of abuse is in breach of the laws of South Africa (question 30)	63 (89%)	0	8 (11%)

Nine (13%) of the respondents were unsure about their role as mandatory reporters and two (3%) felt that they were not required to report at all.

4.3.3. Participation in training on the topic of recognising and reporting child abuse

Respondents were asked if they had attended any training related to the *recognition* of abuse, or training on the reporting of child/infant abuse in the pre-hospital setting. Most of the respondents (n = 54; 75%) had not attended any kind of training on the topic since qualification. These questions reflect the demographic findings and do not report on the knowledge, skill or attitudes of the respondents.

Table 4.11: Respondents who had attended training in recognition of abuse, compared to self-reported comfort in recognising abuse.

	Comfortable recognising abuse (clinical)	Comfortable recognising abuse (history and risk factors)
Respondents who had attended training in recognition of abuse (clinical findings) (n = 25)	19 (76%)	17 (68%)
Respondent had NOT attended training (n = 46)	19 (41%)	15 (33%)

Respondents were also asked if they had attended training on the *reporting* of abuse since they had qualified. Most of the respondents had not attended training of any kind in the *reporting* of abuse (n = 46; 65%). Those respondents who had attended training, reported more frequently that they were comfortable in recognising abuse based either on clinical signs or risk factors and history. The comparison can be found in Table 4.12 below. The table above reflects a comparison between the attendance at learning interventions on the topic of abuse and how this affected the attitude to the recognition and reporting of abuse in the infant patient.

Table 4.12: Distribution of respondents who attended training in recognising and reporting abuse (n= 71)

	Training on recognition		Training on reporting	
<i>Total Years' Experience</i>	Yes	No	Yes	No
0 – 4 years (n = 44)	15 (34%)	29 (66%)	13 (30%)	31 (70%)
5 – 8 years (n = 16)	6 (38%)	10 (62%)	4 (25%)	12 (75%)
9 – 15 years (n = 10)	4 (40%)	6 (60%)	3 (30%)	7 (70%)
16 – 20 years (n = 1)	0	1 (100%)	0	1 (100%)
<i>Qualification</i>	Yes	No	Yes	No
Ambulance Emergency Assistant (n = 26)	7 (27%)	19 (73%)	8 (31%)	18 (69%)
Emergency Care Technician (n = 8)	2 (25%)	6 (75%)	0	8 (100%)
Critical Care Assistant (n = 24)	11 (46%)	13 (54%)	8 (33%)	16 (67%)
National Diploma in EMC (n = 1)	0	1 (100%)	0	1 (100%)
Bachelor's Degree in EMC (n = 10)	4 (40%)	6 (60%)	3 (30%)	7 (70%)
Master's Degree in EMC (n = 2)	1 (50%)	1 (50%)	1 (50%)	1 (50%)
<i>Age</i>	Yes	No	Yes	No
18 - 25 years old (n = 11)	3 (27%)	8 (72%)	2 (18%)	9 (82%)
26 – 35 years old (n = 43)	14 (33%)	29 (67%)	15 (35%)	28 (65%)
36 - 45 years old (n = 11)	4 (36%)	7 (64%)	2 (18%)	9 (81%)
46 – 55 years old (n = 5)	4 (80%)	1 (20%)	1 (20%)	4 (80%)
Not recorded (n = 2)	1 (50%)	1 (50%)	0	1 (100%)

4.4 Case Results

The cases in the questionnaire were constructed to determine various aspects of the respondents' knowledge about the laws of reporting child abuse as well as their ability to recognise abuse in different settings. The results from the cases are compared to the self-reported knowledge of the respondents to determine whether the respondents are able to (skill) both recognise a case of possible abuse and report the case to the appropriate authorities, and to determine whether the respondent would be willing to report a case of abuse (attitude).

4.4.1 Case One

This case was presented to determine the ability of the respondents to use the infant's history and clinical findings to rule out abuse as a possible cause for injury. The presentation is in line with a possible accidental injury. The table below summarises the points in the history presentation and clinical presentation that indicate that the injury occurred accidentally.

Respondents were asked to respond to the following questions for each case, and the following parameters apply to all the cases that follow:

1. Does the case presentation concern you (is there a concern of possible abuse for this case)?
 - a. This question was related to the skill of the respondent, this means that knowledge was applied to the case and the information interpreted to determine whether or not the case was of concern.
2. Would you be required to report this case to the appropriate authorities
 - a. This assessed knowledge of the respondent (specifically with regard to the law). If the respondent identified the case as suspicious of abuse, the correct answer would be to report the case.

Table 4.13: Responses for binary questions for case one (n=71)

Case 1	Does the case presentation concern you?	Would you be required to report?
Yes (incorrect)	30%	8%
No (correct)	59%	69%
Unsure	11%	23%

Table 4.14 below summarises the indicators that should have been identified in the history and clinical information. What is concerning from Table 4.13 is that 30% of the respondents were worried about the patient presentation as a possible case of abuse, but only 8 % of those respondents decided that they would report the case. The decision to report might not be the appropriate decision, but the concern is that the respondents didn't report despite the fact that they were worried about the infant in the case.

Table 4.14: Elements in the case that should have been identified for the justification of concern (or lack of concern) in case one

History Elements	Clinical Elements
No delay in time to presentation: the timeline makes sense given the story	Injury in line with the mechanism of injury
Well explained and possible story of how the injury occurred (history of injury is forthcoming and specific)	Injury matches the infant's current physical ability and age; it is plausible with regard to developmental age
Two parents, both present at time of injury, both presenting the same information and consistent about the story over time	No evidence of other injury or any other injury not associated with the story at time of presentation

Table 4.15 that follows on the next page summarises the indicators reported in the respondents' comments about the injury.

Table 4.15: Elements identified in the comments as indicators for concern (or lack thereof) for possible abuse in case one

<i>Indicators identified in the respondent's comments</i>	<i>Number of respondents who mentioned this indicator (n = 71)</i>	
Time to presentation at hospital	28	39%
Injuries match the history provided/mechanism explained	22	31%
No evidence of injury that is not part of the current presentation and history (no evidence of other physical injury)	15	21%
Infant appears healthy other than current injury*	10	14%
Parents are worried about the infant *	29	21%
First occurrence of injury to the infant*	3	4%
Infant is easily consoled by the mother* and not uncomfortable in her presence	29	41%

Those marked with the * have been shown in the literature to be the less reliable “red flags” for determining possible abuse in the infant. In this case, the concerning factor is that some of the less reliable means of identification of abuse were used, albeit in conjunction with the more reliable factors. This can be seen in one of two ways.

The indicators that are most reliable in this case are the first three in the table. These findings, although recognised by some of the respondents, were not recognised by the majority of the respondents. The most commonly identified indicator used by the respondents was that the infant was easily consolable by the mother. This is not a very reliable factor, especially when used on its own as an indicator of abuse.

Table 4.15 reflects attitude, as well as skill in application of the knowledge to a real-life case scenario.

Clinical factors were brought up more frequently than the history and risk factors for abuse, on average 26% (n = 21) of the respondents mentioned clinical factors as their decision makers in reporting the abuse verses the 21% average (n = 15) who noted the history and other possible risk factors in their decision making.

4.4.2 Case 2

This case was presented to determine the ability of the respondent to use the infant's history and clinical findings to rule out abuse as a possible cause for injury. The presentation in this scenario was slightly less clear cut, and there were some elements that might increase the suspicion of abuse. Table 4.16 below summarises the points in the history presentation and clinical presentation that indicate that the injury may have occurred accidentally. The case was created to determine knowledge about the "may" clause of the Children's Act of 2005, specifically Section 110A, which stipulates that providers may report a case of suspected abuse (when there is not enough clear evidence to suggest abuse). If the practitioner was concerned about the infant in this case, then it is expected that they would report the case for investigation. As this clause is very difficult to understand and is not applied in a consistent manner in South African law, it was anticipated that this case would present the most challenging scenario for the respondents. The expectation was that there would be an increase in confusion about whether to report this case or not.

Table 4.16: Responses to binary questions for Case two (n=71)

Case 2	Does the case presentation concern you?	Would you be required to report?
<i>Yes (incorrect)</i>	24%	8%
<i>No (correct)</i>	66%	75%
<i>Unsure</i>	10%	17%

The findings for this scenario indicate that for the infant who is not a clear case of abuse, the decision about concern for the infant and reporting is complex. Table 4.17 that follows summarises the history and clinical indicators reported in the respondents' comments about the injury.

Table 4.17: Elements in the case that should have been used for the justification of concern (or lack of concern) in case two

History Elements	Clinical Elements
No delay in time to presentation: the timeline makes sense given the story	Injury in line with the mechanism of injury
Well explained and possible story of how the injury occurred (history of injury is forthcoming and specific)	Injury matches the child's current physical ability and age; it is plausible with regard to developmental age
Child can be consulted to determine what happened	No evidence of other injury or any other injury not associated with the story at time of presentation

Table 4.18: Elements that were identified in the comments about the case as indicators for concern (or lack thereof) for possible abuse in case three (n=71)

<i>Indicators Identified in the respondent's comments</i>	<i>Number of respondents who mentioned this indicator (n = 71)</i>	
Time to presentation at EMS (Emergency Medical Services)	11	15%
Injuries match the history provided/mechanism explained	32	45%
No evidence of injury that is not part of the current presentation and history (no evidence of other physical injury)	15	21%
There are witnesses to the injury (other adults and children)	4	6%
Infant is easily consoled by the teacher* and not uncomfortable in her presence	50	70%

The indicators that are most reliable in this case are the first three in the table. At least one of these indicators were recognised by 58 of 71 of the respondents, but very few recognised all three reliable indicators. The most commonly identified indicator used by the respondents was that the infant was easily consolable by the teacher. This is not a reliable factor, especially when used on its own as an indicator of abuse. The majority (70%) of the respondents used the fact that the child was consolable as a reason to believe the story told. Children of abusers often have a connection with the adult who has been abusive, because they have no other adult to connect with.

In the cases where the risk of abuse is present, but not clear, the more reliable “clinical red flags” become important in the diagnosis of non-accidental injury.

Clinical factors were brought up more frequently than the history and risk factors for abuse, on average 45% (n = 32) of the respondents mentioned clinical factors as their decision makers in reporting the abuse verses the 10% (n = 7) average who noted the history and other possible risk factors in their decision making.

4.4.3 Case 3

This case was presented to determine the ability of the respondent to use the infant’s history and clinical findings to rule in possible abuse as the cause for injury. The presentation in this case was clearly an infant who had been exposed to some form of non-accidental trauma resulting in severe injury. The case was created to lead respondents into a false sense of security with some of the presentation factors consistent with those findings common in an accidental injury, but with some obvious red flags for those who are *au fait* with recognising abuse in the infant population.

The case was created to determine the respondent’s awareness about the “must” clause of the Children’s Act of 2005, specifically Section 110B, which stipulates that with evidence of abuse the practitioner MUST report abuse. The abuse here was not as clear cut as one would think, as it relies on the recognition of certain history and clinical assessment elements for the diagnosis of abuse to be made.

Table 4.19: Responses for binary questions for case three (n=71)

Case 3	Does the case presentation concern you?	Would you be required to report?
<i>Yes (correct)</i>	98%	85%
<i>No (incorrect)</i>	2%	15%
<i>Unsure</i>	0.0%	0.0%

Of concern in this case was that 98% of the respondents are concerned about possible abuse in the case, however, only 85% of these respondents identified that they were required to report the case (See Table 4.19). This indicates a disconnect between the ability to recognise abuse and the decision to report the possibility of abuse, and may be related to the finding earlier in the study that many of the respondents were not aware of their role as mandatory reporters of abuse in the child and infant population. Table 4.20 highlights the elements that should have been used in the decision-making process related to concern and requirement to report.

Table 4.20: Elements in the case that should have been used for the justification of concern (or lack of concern) in case four

History Elements	Clinical Elements
Delay in presentation to help (timeline)	Injury is not probable with the child's age and physical development, no clear history with severe trauma
History is vague and non-specific and doesn't match the injuries found in the clinical examination	Presentation to a GP and not to the Emergency Department is not normal with the severity of presentation
Possible ongoing abuse/injury over a period of two weeks is a concern	Signs of raised intracranial pressure suggest a severe head injury

Table 4.21 below summarises the factors reported in the respondent's comments about the injury.

Table 4.21: Elements that were identified in the comments about the case as indicators of concern (or lack of concern) for possible abuse in case four

<i>Indicators Identified in the respondent's comments</i>	<i>Number of respondents who mentioned this (n = 71)</i>	
Time to presentation	25	35%
Injuries don't match the history provided	43	61%
Vague mechanism of injury reported	4	6%
Clinical signs of raised intracranial pressure/shaken baby syndrome	20	28%
Developmental age of the infant doesn't match accidental injury	8	11%

Reliable factors that lead to a suspicion of abuse were not consistently noted in this case, with the only reliable measure (injuries don't match the history given) being noted by a larger percentage of respondents (61%). The other reliable factors were not noted.

There were two concerning comments that were recorded for this case. They have been quoted directly from the questionnaire feedback below:

1. "The swelling is a concern. It is the responsibility of the doctor to report the case...it is not for me to question the medical practitioner, BUT I will follow up both at hospital and with the practitioner." (Respondent 188)
2. "This it is a clear medical condition case, probably a TOF condition" (Tetrology of Fallot) (Respondent 213)

These two comments indicate the lack of knowledge of at least two of the respondents that they have a role as a mandatory reporter of abuse and indicate that they were not clear about the clinical presentation and the possibility of abuse. The respondent who made the second comment, self-reported that s/he was comfortable in recognising possible abuse from both clinical and history factors.

Clinical factors were brought up more frequently than the history and risk factors for abuse, on average 33% (n = 23) of the respondents mentioned clinical factors as their decision makers in reporting the abuse verses the 21% (n = 14) average who noted the history and other possible risk factors in their decision making.

4.4.4 Case 4

This case was presented to determine the ability of the respondent to use the infant's history and clinical findings to rule in abuse as the cause for injury. This case is clearly an abused infant with strong elements in the history and presentation that lead to a conclusion of abuse. The case was created to determine knowledge about the "must" clause of the Children's Act of 2005, specifically Section 110B, which stipulates that with evidence of abuse the practitioner MUST report that abuse. The abuse here is clear cut and not open to interpretation. There were several strong identifiers of abuse in this case. These can be found in Table 4.23.

Table 4.22: Responses for binary questions for Case four (n=71)

Case 4	Does the case presentation concern you?	Would you be required to report?
<i>Yes (correct)</i>	100.0%	83.6%
<i>No (incorrect)</i>	0.0%	14.8%
<i>Unsure</i>	0.0%	1.6%

Again, the concern in this case is that ALL the respondents were concerned about this infant as a high risk of abuse, however, only 83% of these respondents recognised the need to report the case (See Table 4.22). This seems to be a trend in the findings, often the clinical presentation is relatively easy to assess as a possible high-risk case for infant abuse, but the respondents were not aware of the need to report the case. As stated in Chapter 2 of this study, there are numerous reasons why providers may not report a case of infant abuse, even when it is strongly suspected.

Table 4.23: Elements in the case that should have been used for the justification of concern (or lack of concern) in case five

History Elements	Clinical Elements
Delay in presentation to help (timeline)	Signs of neglect
History is vague and non-specific and doesn't match the injuries found in the clinical examination	Fractured Femur not likely with a simple fall from the cot
Possible ongoing abuse	Bruises in different shades and states of healing
Caregiver is not the biological parent	Child willingly seeks care from strangers, developmentally this is not the norm for a child of this age
Conditions of the apartment/socioeconomic status	
Caregiver does not appear concerned	

Table 4.24 below summarises the themes reported in the respondent's comments about the injury.

Table 4.24: Elements that were identified as indicators of concern (or lack of concern) for possible abuse in case five

<i>Indicators identified in the respondent's comments</i>	<i>Number of respondents who mentioned this indicator (n = 71)</i>	
Time to presentation/delay in the call for help	5	7%
Injuries don't match the history provided	32	45%
Vague mechanism of injury reported	0	0%
Bruising and other injuries (different stages of healing)	43	61%
Uncaring caregiver/no concern for child	17	24%
Child reaches out to a stranger for care/assistance*	23	32%
Squalid conditions of the living environment*	41	58%
Caregiver is not the biological parent	15	21%

Table 4.24 illustrates that despite there being clear indicators of abuse, such as recognising patterns in bruise markings and identifying the caregiver as a non-biological caregiver, these indicators were not recognised as often as the less reliable red flags (such as relationship of child to the pre-hospital emergency care providers and squalid conditions of the house).

Two of the best indicators of possible abuse in the infant population were not recognised by the respondents (vague mechanism with obvious injury, and the delay in time to call for help). History and risk factor findings were poorly identified; however, the clinical findings were more commonly recognised (this is in keeping with the findings from earlier in the questionnaire where more respondents were more comfortable in recognising the clinical features than the history and risk factor features as seen in Fig 4.7)

Clinical factors were brought up more frequently than the history and risk factors for abuse, on average 38% (n = 27) of the respondents mentioned clinical factors as their decision makers in reporting the abuse verses the 21% (n = 14) average who noted the history and other possible risk factors in their decision making. The (n) represents an average over the factors and not an absolute number in this case.

4.4.5 Case 5

This case was presented to determine the ability of the respondent to use the infant's history and clinical findings to suspect an unnatural death which required further investigation in the form of a formal autopsy. This case was created to determine the pre-hospital care provider's ability to recognise that the death of an infant is always a reason to refer for autopsy. There are elements in the clinical and history presentation that are not consistent with a natural death.

For this case, there was an emphasis on determining the respondent's knowledge about the diagnosis of SIDS (Sudden Infant Death Syndrome) in the pre-hospital environment. The three questions represented below asked the respondent if they were concerned about the case, if they needed to report the case for possible suspicion of infant abuse,

and if the infant needed to be referred for a post-mortem investigation. Respondents were generally concerned about the case presentation (85% of the respondents). There is a need in this case to report the infant for post-mortem examination as the death was unexpected, and possibly “unnatural”.

Table 4.25: Showing responses for binary questions for case five

(n = 71)

Case 5	Is the presentation concerning?	Would you be required to report?	Does the infant need a post-mortem?
Yes	60 (85%)	50 (70%)	64 (90%)
No	9 (12%)	11 (15%)	3 (4%)
Unsure	2 (3%)	10 (14%)	4 (6%)

Respondents were asked to decide if they should refer this infant for a post-mortem investigation. According to the law in South Africa, all deaths that are not expected or that occur suddenly should be referred for a post-mortem investigation. Most of the respondents (n = 64 90%) suggested that the infant be sent for a post-mortem, while four (6%) would not refer the infant, a further four (4%) were not sure whether this infant’s death needed to be investigated. The concern in this case again, was the fact that a larger percentage of the respondents were concerned about the presentation as a possible risk of abuse, but 11 (15%) of these respondents did not recognise that the case should be reported. Despite this, 64 (90%) of the respondents understood that the infant needed to be referred for post-mortem even though they were not all concerned about abuse. Another concerning finding is the 10 (14%) respondents who were not sure if they needed to report the case.

Table 4.26: Elements in the case that should have been used for the justification of concern (or lack of concern) in the case five

History Elements	Clinical Elements
Timeline makes no sense (length of time for rigour mortis to set in)	Rigour mortis not likely within 1 hour of death
History is vague and non-specific	No other clinical findings that could lead to a suspicion
Informal day care (not registered with appropriate authorities)/education level of the caregivers	
Caregiver is not the biological parent	
Neglect/time infant left alone	
SIDS mentioned as a possible cause	

Table 4.27: Elements that were identified in the comments about the case as indicators of concern (or lack of concern) for possible abuse case five

<i>Indicators Identified in the respondent's comments</i>	<i>Number of respondents who mentioned this indicator (n = 71)</i>	
Timeline makes no sense/rigour mortis	34	48%
Vague history/not making sense	5	7%
Caregiver not the biological parent	0	0%
Informal day care/education level of the caregivers	13	18%
Neglectful care of the infant	28	39%
This case should NOT be reported	3	4%
SIDS mentioned as a possible "diagnosis"	11	15%

In this case, the use of “SIDS” as a reason for not reporting the infant to authorities is a concern, as by definition SIDS is a diagnosis of exclusion. This means that the diagnosis should only be made after a post-mortem when no clear indication of a cause of death has been found. The concern as with all the other cases was that the more reliable red flags were not used as often as the less reliable findings (for instance, vague history and the fact that the child was not with a biological caregiver were mentioned infrequently or not at all).

1. There were two concerning comments made in the feedback on this case: “There is no obvious evidence of trauma. Not required to report”
2. “This seems like a classic case of SIDS; however, I think the child is a bit old for SIDS. There is no signs of abuse and I do not think the child was neglected so I do not think you need to report this as abuse.”

These comments were of concern as the infant does not always show signs of obvious trauma. The absence of obvious signs of trauma externally is not a good enough reason to rule out possible trauma. Infants who do show signs of trauma have often been so badly injured that they are not likely to be missed by the provider.

The second comment is concerning as SIDS is not something that can be diagnosed in the pre-hospital setting. It must be investigated. Making the assumption that a child has died due to SIDS in the pre-hospital environment means that the infant may not be referred for autopsy and the investigation into the cause of death will not occur. Even if this is a natural death, that can only be identified on thorough examination of the body post-mortem.

Clinical factors were difficult to report on in this case as the clinical and history factors are not separable. The fact that rigour mortis is present so early is a clinical sign and history sign. For this case there was not clinical information other than the rigour mortis to rely on. This was brought up by almost half of the respondents.

4.5 Summary

The results from the of the questionnaire data have been detailed and concerns raised. The case study findings have been presented and explained. The findings presented in this chapter will be discussed in Chapter Five.

CHAPTER 5: DISCUSSION

5.1 Introduction

Child abuse is a global problem affecting children from all walks of life, all socioeconomic levels and of almost any age. Infant abuse is difficult to recognise and even more challenging to report, as the signs and symptoms are often not overt or easy to detect. Infant abuse is a problem in South Africa and globally with often, the first point of contact for the infant who has been injured being the pre-hospital care provider.

In this chapter the findings of the study conducted to determine the knowledge, skills and attitudes of pre-hospital care providers in South Africa with regard to the recognition and reporting of infant abuse, in the pre-hospital setting are discussed. The chapter will detail the findings of the study, looking at three separate domains. These are: the self-reported comfort of the provider in recognising and reporting abuse, the knowledge of the provider with regard to recognition of physical abuse in the infant population, and the ability of providers to recognise the abuse and recognise the need to report the case. The application of this knowledge to the case studies will be discussed.

South African law (Section 110 of the Children's Act 2005), identifies all health-care providers as mandatory reporters. The law is very specific about who needs to report as well as when reporting MUST and MAY occur. There is no law, or recommendation in South Africa regarding the kind of education a practitioner should receive on the topic of recognising and reporting abuse of the infant in the prehospital setting. There is little formal teaching provided at undergraduate level, and no requirement for graduates to remain current with the latest evidence or changes in law in the field once qualified. The requirement to recognise and report, in order to protect the vulnerable children of South Africa has been legislated, but the system supporting the medical professional, and indeed any professional who deals with children is not present to the extent to which it should be.

5.2 Demographic Findings

As the desired sample size was not achieved, all results discussed here are descriptive in nature.

The study included respondents from different age groups, qualification groups, genders and years of experience. The gender distribution was consistent with the expected gender demographic, 63% of respondents were male. This is consistent with the HPCSA statistics from 2018, which reported that 70% of those in the target population were male.

Most of the respondents in the study represented the private sector (73%); this may have been as a result of the methods employed to enrol respondents. As a result, the information reported here is not representative of government practice, and only partially represents those in the semi-private or government sectors.

The majority of the respondents who enrolled in the study were from either the ANA (Ambulance Emergency Assistant) (37%) or CCA (Critical Care Assistant) (34%) qualifications. Based on the HPCSA annual report of 2018, this is not consistent with the profile of the practitioners currently registered in the country where the ANA's constitute 75% and the CCA's 11% of the profession.

Based on the sample group representation of CCA providers, this sample may be skewed by the number of highly qualified prehospital practitioners in the group and is not representative of the population. The number of advanced life support providers represented in this study was not representative of the country's demographic. Less than 14% of the pre-hospital care providers in the population studied are CCA providers according to HPCSA statistics for 2018. In this study the percentage of CCA qualified respondents was more than double that, with a representation of 34%.

The age of the respondents was more representative of the population, with younger respondents constituting the greatest number of respondents. The two youngest groups in the study (18- 35 years) comprised 75% of the sample. This is slightly higher than the HPCSA reported statistics from May 2015 which state that 59% of registered practitioners in the population are under the age of 39.

Respondents with more years of experience in the field, responded more frequently that they were comfortable in recognising cases of abuse in the infant from the history or clinical presentation. This was in line with the expected finding that experience and age would increase the comfort with recognising abuse.

Most of the respondents had 9-15 years' experience (41%), with 25 % of the respondents having 0-4 years of experience. The group of respondents with the most experience was more likely to respond that they were comfortable in recognising abuse (See Table 4.5. Younger respondents reported that they would report a case of suspected abuse as often as their older counterparts.

Most respondents did not interact with infants frequently. A large percentage of respondents (87%) reported that they saw less than five infants in their practice per month. The majority of the respondents (62%) treated 0 - 2 infants per month as part of their practice. Although this may seem like a relatively small number of infants, it translates to approximately 24 infant interactions per practitioner per annum. The respondents in this study reported a total interaction with at least 1500 infants in a year (2 infants per provider per month over 12-months). The group of respondents who reported treating less than two infants per month reported being less comfortable in recognising abuse in the infant population, and surprisingly, the group who interacted with more than 12 infants per month were also less likely to report being comfortable in recognising infant abuse. This may reflect the fact that the pre-hospital emergency care provider who sees a number of infants, recognises the inherent difficulties in the recognition of physical abuse in this population.

It may be argued that with too little interaction with infants in the pre-hospital setting, the subtle signs of infant abuse may easily be missed by the providers. Recognition of abuse in this population is difficult for experienced providers and can be made even more difficult when the provider is not dealing with infants on a regular basis, however, this reinforces the need for ongoing education to maintain knowledge in recognising abuse in this population.

Concerning results from the questions above were that less than 64% of all respondents had ever been trained in the recognition of abuse, and even fewer had received education

on the reporting of abuse if encountered. Most (65%; n=46) of the prehospital care providers reported that they had not attended ongoing professional development in the field of recognition or reporting of infant abuse at any time since they had qualified. Based on the curricula of both the short courses and undergraduate studies, infant abuse is given minimal attention at an undergraduate level, and it appears that this trend continues after qualification.

5.3 Teaching in the topic of infant abuse recognition or reporting

There may be a relationship between provider training since qualification and provider comfort in recognising abuse based on clinical factors and history. A larger study with more respondents would be required in order to confirm this observation. More respondents (n = 19; 76%) who had received training were comfortable in their ability to recognise abuse in the infant based on the clinical findings, while only 41% (n = 19) of those who had not attended training were comfortable in recognising abuse.

Respondents were more comfortable in recognising abuse based on the clinical presentation than history, with only 68% (n=17) of those who had attended training (n=25) being comfortable in recognising abuse based on the history and risk factors, and only 33% (n=15) of those who had not attended training (n = 46) being comfortable in recognising abuse based on history and risk factors. Respondents who had attended training previously did appear to be more comfortable with their ability to recognise abuse in the infant population with 76% (n =19) of the respondents who had attended training (n = 25) being comfortable to recognise abuse with clinical signs, and only 41% (n =19) of those who had not attended training (n = 46), reporting they were comfortable. The same trend was found in the recognition of abuse from history and risk factors, with 68% (n = 17) of the respondents who had attended training (n = 25) feeling comfortable with the recognition of abuse

This highlights the need for specific training in the recognition of abuse in the infant patient, both with regard to the history and clinical factors that may alert the provider to abuse. These findings are consistent with the literature (Bunting, Lazenbutt and Wallace, 2010; Dessena, et al., 2015), which reports that the better trained an individual is in the recognition of abuse, the more comfortable they are with their ability to recognise it.

5.4 Knowledge with regard to infant abuse

This study described the self-reported knowledge about the recognition and reporting of infant abuse in the prehospital setting as well as the actual knowledge of the respondents through a series of case presentations. The perceived level of knowledge regarding the recognition and reporting of abuse was found to be higher than the actual level of that knowledge. Postgraduate training in the recognition and reporting of abuse increased the likelihood that the respondent would report in less obvious cases of abuse. However, the number of respondents who had received postgraduate education was small ($n = 25$; 35%).

Those who had received education on the topic were more likely to be overly cautious and report cases that were not associated with abuse. This was found to be true with the first case scenario. The infant in this case met none of the history or clinical red flags for abuse in the case presentation. However, those who had been educated in the reporting of abuse were more likely to recommend reporting the case to the authorities. Although this may result in an increase in resources in the short term, the risk of missing a case of abuse outweighs the risk of overuse of resources. Cases 3 and 4 were both high risk cases for abuse, and the same pattern emerged, in that reporting was recommended more often. In instances such as this, it may be worth the increased use of resources to rule out abuse, than to not report, and miss abuse.

Those who had been taught about reporting of abuse were more likely to report the case, meaning the likelihood of missed cases of abuse in those who had been exposed to learning the topic would decrease. Case 4 was very clearly an infant who had been

abused. Where the respondent had been trained (n=25), 100% agreed that the case needed to be reported. Where the respondent had not been taught (n= 46) on the subject, only 90% agreed that the case needed to be reported, with 7% (n=3) being unsure whether they needed to report or not. Although this represents a small number of respondents, the potential effect of not reporting a case of clear abuse is of much greater concern.

Overall 52% (n = 37) of the respondents reported that they knew the procedure for reporting abuse. Those with more experience in the field were more likely to know the procedure for reporting abuse. The group with the least experience was more likely to know the procedure for reporting than the other groups. Of those in the group with 5 – 8 years of experience in the field, only 20% (n = 3) had attended any educational update on the recognition of abuse since qualification, and this was in line with the finding that in the same experience group, a lower percentage of respondents knew the reporting procedure for abuse (47% versus the overall average for that question of 55%).

The relationship between attending workshops on the topic and willingness to report, as well as the self-reported comfort with the ability to detect abuse, indicates the importance of teaching prehospital emergency care providers about abuse. It may equip the prehospital provider with the appropriate knowledge to recognise and report cases of abuse. Without the appropriate education the provider is left to make difficult judgements and legal decisions, without the knowledge to support them.

Respondents were unsure about what the law required from them in certain cases and were not always sure whether the case required them to report, or if there was evidence that may lead to a suspicion of infant abuse. Each case presented in the results section show that respondents were more likely to report on the clinical findings (such as bruising, wounds and presentation of the child), than the historical findings (such as the time to presentation, the history not matching the presentation and a previous history of the child being injured) practitioners were able to recognise many of the concerning elements in the clinical presentations as compared to key elements in the history in many of the clinical cases. It seems the pre-hospital provider is more at ease with physical elements of the clinical examination than with elements presented in the history. It was evident from the

data that the respondents were generally not sure about the two distinct requirements of the law. The “may” and “must” clauses are not well understood. This meant that in the cases that were not suspicious, the respondents thought that they were still required to report (in cases where there was no clear evidence of possible abuse, the practitioner is not REQUIRED to report the case, rather, they are compelled to consider reporting the case). If there is clear evidence of abuse, or evidence that leads to the possible conclusion of abuse, then the provider MUST report this.

This confusion regarding the “may” and “must” clause of Act 110 of the Children’s Act of 2005 was most evident in case 1 and case 2. These cases were not clear cases of possible abuse, and there was very little evidence that would lead the practitioner to the clinical diagnosis of infant abuse. However, both reflected the element of possible neglect. The neglect in both these cases did not come across as intentional, meaning that Act 110 (2) of the Children’s Act was in force. The practitioner “may” report the case for further investigation and to access assistance for the infant in question but is not under legal obligation to do so.

5.5 Attitudes to infant abuse and reporting

Particularly worrying is the fact that 10% (n= 7) of respondents had suspected abuse and not reported it, and a further 14% (n=10) were unsure of the answer to this question (question 21) (See Table 4.9) This is a concern based on the number of infants interacted with on a monthly and annual basis, as well as the concern that 14% (n = 10) of the respondents in this study had been in contravention of the Children’s Act, 38 and 2005, Section 110. Those who had been unsure about their duty to act also concerned the researcher, as the respondents in this study were all independent practitioners, meaning that they operated in the pre-hospital environment with little or no oversight of their actions or decisions within their scope of practice. These pre-hospital emergency care providers should be sure of their role as mandatory reporters and should be able to identify incidences when they are required to report cases of suspected abuse.

The independent practitioner cannot be unsure of the laws pertaining to their practice and should be able to interact with at risk populations (such as the infant) without being unsure of their roles or responsibilities. In this case, the pre-hospital emergency care providers should understand their roles as mandatory reporters for all cases of suspected abuse in the infant population and should know without any doubt when and what should be reported.

A possible barrier to the reporting of infant abuse was identified in this study. Question 23 asked the respondents whether they felt a report made to the appropriate authorities would “be well received and followed up on”. Most respondents (n= 39; 69%), answered that they were not sure a report would be followed up, or they believed a report would not be followed up. This is telling. If the respondent does not feel that a report would achieve anything, or be followed up, the likelihood of a report being made is low. This is reflected in other literature on the topic and remains a barrier to the reporting of abuse in many settings (Hendriks. 2014; Lynne, et al. 2015; Talsma, et al. 2016)

A concerning finding was that in those respondents who had reported a case of abuse to authorities; 19% (n= 5) believed that the case would not be followed up by the authorities. More of respondents (35%; n= 16) who had not reported a case of abuse answered that they thought a report might be well received and followed up. This may speak to the experience of the prehospital emergency care provider who had reported a suspicion of abuse, and found their report was either not taken seriously or not followed up appropriately.

5.6 Case Findings

The comments from the cases as captured by the individual respondents can be found in Appendix K.

5.6.1 Case One

In Case one, 30% (n = 21) of the respondents answered that they were concerned about the case presentation as a possible suspicious case for abuse. The second question which asked if the case was to be reported also indicated that respondents were not sure (n=16; 22.5%), whilst 9% (n= 6) were under the impression that they were required to report this case to authorities. The most telling figure in this question is how many of the independent practitioners, responsible often as the sole decision maker in the pre-hospital setting, were not sure if they should be concerned or not, and even more (11%; n=8) were not sure if the case required reporting or not.

Although it is better to have a high sensitivity to reporting cases of abuse, especially in such a vulnerable population, specificity is also an important requirement. If all cases where infants are treated, are reported to authorities, the risk is that there may be an increase in the reported cases, when they are not required to be reported. This may result in unnecessary use of resources in a system that is already maximally stretched. In an environment such as South Africa, which is resource limited with strict constraints on resource allocation and use, these unnecessary case reports might be wasteful. A more specific tool for the recognition might be required. This is a subject for further research.

In this case the average number of respondents to comment on clinical factors to support their decisions was greater than the average number to pick up on historical factors, these values can be found in the results section for each case.

5.6.2 Case Two

Case two presented a similar problem in that the infant's history and presentation did not indicate any of the "red flag" assessment findings that might lead to a suspicion of abuse in the child. However, there are some elements of concern around safety in the play area and supervision. This is a case that most definitely falls into the "may" clause of Section 110 of the Children's Act and does not require a report by law. It only suggests that the case may be reported.

A finding of concern here is that almost a quarter (23%; $n = 16$) of the respondents were concerned about possible abuse with 9% ($n = 6$) of the respondents reporting they were not sure; 16% ($n = 11$) of the respondents didn't know if they were required to report the case or not. Of more concern to the researcher with these two cases, was that although a number of the respondents felt the child was at risk of abuse, only a very small percentage of the respondents felt they needed to report the case (In Case 1, 30% ($n = 21$) were concerned about abuse, while only 9% ($n = 6$) felt they needed to report the case. In Case 2, 23% ($n = 16$) were concerned and only 10% ($n = 7$) felt the case needed to be reported).

What can be taken from this finding, and what has been mirrored in findings from other studies across the world; is that medical professionals may be able to identify abuse in the infant patient but are less likely to report the finding of abuse even when they find it (Markenson et al., 2002; Borres and Hägg, 2007).

In case two, 30% ($n = 21$) of the respondents used only unreliable factors to make the decision that the child was not at risk of non-accidental injury. These unreliable factors are flags in the history that have not been shown to be reliable in the prediction of possible abuse. In this case, this did not increase the risk for the child in question, however, if these unreliable flags are being used in all cases and are being used as the only information on which to base a decision, the risk is that infants in their care may not be identified as abuse cases.

In this case the average number of respondents to comment on clinical factors to support their decisions was greater than the average number to pick up on historical factors, these values can be found in the results section for each case.

5.6.3 Case Three

There were two concerning comments that were recorded for case three. The concerning comments have been quoted directly from the questionnaire

1. "The swelling is a concern. It is the responsibility of the doctor to report the case...it is not for me to question the medical practitioner, BUT I will follow up both at hospital and with the practitioner."
2. "This it is a clear medical condition case, probably a TOF condition" (TOF standing for Tetralogy of Fallot)."

Case 3 was a clear case of non-accidental injury, based on the very clear evidence of possible trauma with no history to explain the traumatic injury findings. This infant's case is a classic pre-hospital presentation for the infant who has been injured in a non-accidental way. Pre-hospital staff should be able to recognise this kind of patient based on the clinical presentation and the history findings. More importantly, pre-hospital emergency care providers should be able to identify those cases where their role as a mandatory reporter comes into play. To report cases of suspected abuse, the provider MUST be able to recognise it, and this recognition should be based on those findings which are consistently associated with increased likelihood of abuse, not on findings that are non-specific or unreliable.

This was one of the learning points identified for the online educational intervention, as this was a theme identified in the questionnaire data. Education around the commonly found clinical and history elements that are associated with infant abuse were included in the online intervention as a teaching outcome and were emphasised throughout the online interaction with the respondent.

In this case the average number of respondents to comment on clinical factors to support their decisions was greater than the average number to pick up on historical factors, these values can be found in the results section for each case.

5.6.4 Case Four

As case 4 was intended to determine the respondent's ability to rule in abuse in an infant, it was expected that this case would be found by all participants to be a concerning patient presentation, and it should have been recognised by all participants as a case for reporting to the police. The infant in the case presents with clear indications of abuse, and non-accidental injuries. The infant presents with all the history and clinical findings of a non-accidental injury. This infant represented the "must clause" in the Children's Act 110 (of 2005) and requires that the infant's case be reported.

Important facts that should have been recognised in this case were the information provided in the history that didn't match the clinical examination, there are signs of ongoing abuse with injuries of different ages, the delay in calling for help is a definite red flag, and the caregiver concern is a problem in the presentation. These facts are the reliable red flags that indicate a possible history of non-accidental injury.

In this case the average number of respondents to comment on clinical factors to support their decisions was greater than the average number to pick up on historical factors, these values can be found in the results section for each case.

5.6.5 Case Five

The intention of case was to determine the respondent's ability to recognise inconsistency in the presentation of the infant, that the clinical and history findings are inconsistent with the timeline and the state of the infant. This case was also designed to determine whether the respondents were able to recognise that they needed to report this case for

investigation, as well as to refer this infant for a post-mortem examination in accordance with the laws of the country.

In this case it was difficult to differentiate between the clinical and historical findings as they were so closely entwined, specifically with reference to the onset of rigour mortis, this was both a clinical and historical sign. In this case the recognition that the timeline for the onset of rigour mortis did not make sense was noted more commonly by the respondents (48%, n = 34).

5.7 Online Educational Intervention

The online intervention was created and made available as a free resource to anyone who wished to learn more about the case of infant abuse in the prehospital environment. The creation of this online intervention met with some challenges as the available information about abuse in the infant population is scarce, and so much of the information was drawn from international sources. South African research on the topic, as well as teaching resources are scarce and had to be created *de novo* to accurately present the South African laws. There has been some interaction on the online platform. From the time of publication of the intervention until July 2018, 26 people had enrolled and completed the learning on offer.

5.8 Summary

The findings presented from the questionnaire and their implications for the creation of an online intervention on the subject of recognising and reporting of infant abuse have been discussed. The findings from the study have been presented and discussed in relation to the aims of the study. The extent to which the study met the aims as designed will be discussed in the next chapter. The limitations and recommendations of this study will be discussed in the following chapter.

CHAPTER 6: SUMMARY, RECOMMENDATIONS, LIMITATIONS AND CONCLUSIONS

This chapter will explore the limitations of this study as well as some of the recommendations for further research, and practice recommendations for the pre-hospital environment.

One of the study's objectives was to determine the prehospital emergency care provider's ability to recognise the clinical signs and symptoms of abuse in the infant population, as well as the elements of patient history that indicate abuse in the infant population. In the cases reported in the previous chapter, it was noted that the clinical findings and examination are more likely to be recognised by the prehospital emergency care provider. Factors in the history are less likely to be recognised. In four of the five cases presented in the questionnaire, the respondents noted clinical signs more often than the history signs that might lead to a diagnosis of abuse. Case 5 proved to be more complicated with the clinical and historical elements being identified through the same identifier (in this case the clinical and historical elements both used rigour mortis as the defining feature. This was both a clinical and history related feature as time to onset represents history but the fact that the infant was in rigour mortis represents clinical findings.

Another objective of the study was to determine the prehospital emergency care provider's awareness of his/her role as a mandated reporter of possible abuse in the infant population. Sixty (84%) of the respondents in this study were able to recognise their responsibility, and nine (13%) were not at all aware or sure of their role in this capacity. Furthermore, 24% (n=17) of the providers were not sure whether they would be in breach of the law if they did not report a case of abuse in the child or infant.

An objective of this study was to determine whether the years of experience and age of the respondents played a role in the knowledge, skills and attitudes of the respondent toward the recognition and reporting of infant abuse. A larger study would be needed to determine whether the relationship between these variables is a reliable predictor of ability and attitudes regarding recognition and reporting of abuse.

The final objective of this study was to develop an online educational intervention to meet the problems identified by the questionnaire. Further studies on the effect of this intervention on the knowledge, skills and attitudes of prehospital emergency care providers should be carried out.

An educational programme was created based on the findings of this study and can be used to inform prehospital emergency care providers in the three domains required to better recognise and report cases of infant abuse in the prehospital environment. Further studies should be conducted to determine the extent to which this online programme contributes towards a change in the knowledge, skills and attitudes of prehospital emergency care providers in the recognition on reporting of infant abuse.

6.1 Limitations

There are several limitations that have been identified in this study. Most notable of all is the sample size. Only 71 respondents completed the entire questionnaire. There were over 200 respondents who started the questionnaire, which was promising however, possibly due to the length of the questionnaire and the intense nature of the case studies, it appears that respondents left the study after the initial Likert scale questions. The cases required a large amount of reading and thought from the respondent and five cases may have required too much of the respondents.

The recruitment procedure for respondents into this study could have been more aggressive, and perhaps less focused on social media, and more focused on interaction at a grassroots level to include a more diverse group of respondents.

Representation of the population was not as diverse as planned, with a greater representation of respondents being from the private sector than are represented in the population, as well as a greater number of CCA and AEA providers enrolling in the study.

There are some limitations regarding the design of the questionnaire which did not lend itself to the analysis of internal consistency, due to the nature of the questions and scales for reporting of respondents' answers. The extent to which this questionnaire reliably

measured the required information in the target population could not be measured and still requires validation. This would require a larger sample and some revision of the questionnaire.

6.2 Recommendations for practice

Education is a step in correcting the ability of prehospital emergency care providers to recognise and report abuse. All prehospital emergency care providers should be educated specifically in the recognition and reporting of infant abuse. This may increase the comfort of practitioners in recognising and reporting possible abuse, and decrease the risk associated with possibly missing these high-risk cases.

Although the required numbers were not achieved in the study, it was identified that a general lack of knowledge and exposure to the recognition and reporting of physical abuse in the pre-hospital setting exists. Both education in the prehospital environment and topic need to be increased. Undergraduate education and continuing education on the topic of infant abuse should be and compulsory, to enable the independent practitioner in the pre-hospital field adequate time and exposure to ensure that they are better equipped to recognise abuse in the infant patient. Systems within the workplace (both provincial and private sectors) need to be developed to enhance the patient reporting system in order to reduce the infant's risk of slipping through the system.

6.3 Recommendations for further research

Based on the limitations mentioned above, it is recommended that further studies looking at the effect of an online intervention on knowledge, skills and attitudes be conducted to better report on the effect of an online intervention on these domains of learning in the pre-hospital care provider. A further recommendation is to decrease the number and volume of the case studies to decrease respondent fatigue and possibly increase completion of the questionnaire. Alternatively, group interviews or one on one interactions

with respondents could increase engagement and improve the quality of the answers for the case studies.

This study was not large, or diverse enough to report on the knowledge, skills and attitudes of all pre-hospital emergency care providers in South Africa with regard to infant abuse but provided some data on the current state of affairs. There is still much work to be done in the education of the prehospital emergency care provider of infant abuse.

6.4 Summary

The current state of knowledge, skills and attitudes of the pre-hospital emergency care provider towards the recognition and reporting of abuse in the infant population was studied. Although the study did not achieve the estimated sample size to provide information that is applicable to the whole population, it has been found that there are concerns relating to the recognition and reporting of infant abuse in the pre-hospital setting, and there may be space for some of these deficiencies in the knowledge, skills and attitudes to be corrected through an educational intervention.

There may be a place for online educational interventions to assist in correcting the deficiencies found in the knowledge around the mandatory reporting laws within the country, as well as application of the different clauses of the laws. There is a concern that independent practitioners were not always able to recognise infant abuse from either the clinical signs or elements in the history of the patient.

This is a subject for further review. More work should be done to determine if the use of an online intervention is a valid and effective tool for the delivery of knowledge, and if learning from an online intervention is able to effect attitudinal change in the respondent.

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APPENDICES

Appendix A: CCA Curriculum 1998 (pages of relevance)

Doc 5 (Part 1) October 1998

- Discuss the assessment and management of the following infant and child emergencies :
 - * Shock.
 - * Heart failure.
 - * Coma.
 - * Status epileptics.
 - * Burns.
 - * Trauma.
- Review the approved paediatric drug protocols, pharmacological actions, side-effects, routes of administration and dosage.
- Recognise the various forms of **child abuse** and neglect.
- Describe and discuss neonatal complications.
- Discuss hyaline membrane disease and its immediate management.
- Discuss and describe paediatric respiratory tract disease with reference to causes, pathophysiology, clinical features, advanced emergency care and complications.
- Discuss psychological support and management in paediatrics :
 - * Principles.
 - * Reasons.
- Discuss the vasovagal reflex in paediatrics :
 - * Dangers.
 - * Triggering in infants and children.
- Discuss the following, their aetiology, pathophysiology clinical picture, management and complications :
 - * Hyperpyrexia/fever.
 - * Croup
 - * Asthma
 - * Epiglottitis.
 - * Bronchitis.
 - * Meningitis.
 - * Encephalitis.
 - * Gastro-enteritis, diarrhoea and vomiting.
 - Pathological.
 - Idiopathic.
 - Malnutrition.
 - * Dehydration, including :
 - Fluid and electrolyte replacement.
 - UNESCO universal formula.

- Discuss, describe and explain mental health and mental illness.
- Discuss, explain and describe leadership with reference to types/classifications, characteristics, supervisor, the attributes of a good leader, application of leadership functions as a CCA.
- Discuss, describe, explain and demonstrate communication skills.
- Discuss briefly and explain family disorganisation :
 - The concept of disorganisation.
 - Types of disorganised families.
 - Reasons for family disorganisation.
 - Divorce, the effects on children and the couple, grounds for divorce.
 - **Child abuse** - physical, emotional and sexual.
- Discuss and explain alcoholism with reference to -
 - Types of drinker.
 - The threshold theory of alcoholism.
 - Aetiology.
 - Drinking patterns in the country.
 - The effect of alcoholism.
 - Alcohol and crime.
- Discuss and explain drug addiction with reference to :
 - Effects of drugs.
 - Nature of drug addictions.
 - Extent of drug use in the country.
 - Sex and dagga in the country.
 - Age and dagga in the country.
 - Effects of dagga smoking.
- Discuss, describe and explain suicide with reference to :
 - Actual and attempted suicide.
 - Classification.
 - Family life, alcohol and insanity.
 - Management of suicidal victim.
- Discuss crime and violence with reference to :
 - Classification of crime.
 - Characteristics.
 - Psychological and sociological approach to crime victims.
 - Crime and the victim.
- Discuss juvenile delinquency with reference to :
 - Definition.
 - Child in need of care.

Appendix B: Other relevant Curricula and subject outcomes

BEMC “Paediatric and Neonatal Emergency Care” Outcomes relating to child abuse

Child Abuse

- Define the various forms of physical and sexual child abuse and child neglect.
- Identify behavioural and physical signs suggestive of these types of abuse and/or neglect in different paediatric age groups.
- Identify behavioural and physical signs suggestive of these types of abuse and/or neglect in different paediatric age groups.
- Describe behavioural characteristics that may be encountered in the abusive parent or caregiver at the time of patient contact or interaction.
- List the steps to be taken in reporting suspected cases of child abuse and/or neglect.
- Discuss the pivotal role played by accurate recording of clinical and circumstantial data for future use, within the context of legal procedure.

Purpose of the subject, with abuse specific highlighted in yellow:

5. PURPOSE OF THIS SUBJECT

The purpose of studying Paediatric & Neonatal Emergency Care is to develop and demonstrate the following broad outcomes on the culmination of your learning activities:

- Discuss the basic principles of history taking and clinical assessment in paediatric patients, with particular reference to anatomical and physiological differences across paediatric age groups.
- Demonstrate effective and clinically useful history taking in paediatric patients.
- Identify the hypoxic or shocked paediatric patient through a well-structured, targeted clinical examination.
- Discuss and demonstrate effective application of basic and advanced life support resuscitation algorithms and skills for newborns, infants and children.
- Describe the aetiology, clinical features and management of a range of emergencies in neonates.
- Describe the aetiology, clinical features and management of a range of emergencies in infants and children.
- Discuss the recognition and reporting of child abuse and neglect, in addition to specific principles of acute treatment.
- Discuss the epidemiology of paediatric HIV/AIDS in South Africa and the most common associated presenting clinical conditions.

AEA Curriculum

Hours allocated in the AEA programme

(Netcare Faculty of Emergency and Critical Care. 2009. Ambulance Emergency Assistant Course Curriculum. (Based on the 2006 Ambulance Emergency Assistant Curriculum HPCSA).

7. SUBJECT HOURS, COURSE CONTENTS AND OBJECTIVES:

THEORY

7.1	PROFESSIONAL, PRACTICE AND ETHICS	:	5 HOURS
7.2	AMBULANCE THEORY	:	45 HOURS
7.3	AMBULANCE TRAUMATOLOGY	:	30 HOURS
7.4	EMERGENCY CARE	:	30 HOURS
7.5	AMBULANCE TECHNOLOGY	:	15 HOURS
7.6	AMBULANCE (CLASSROOM) PRACTICE	:	85 HOURS
<u>TOTAL</u>		:	<u>210 HOURS</u>

PRACTICAL

7.7	AMBULANCE PRACTICE: OPERATIONAL		
	FRONTLINE VEHICLE WORK	:	120 HOURS
	CASUALTY/TRAUMA DEPARTMENT	:	70 HOURS
	OBSTETRIC UNIT	:	32 HOURS
	PRIMARY HEALTH CARE	:	18 HOURS
<u>TOTAL</u>		:	<u>240 HOURS</u>

THEORETICAL TOTAL		:	240 HOURS
AMBULANCE PRACTICE TOTAL		:	210 HOURS
EXAMINATIONS TOTAL		:	20 HOURS
<u>COURSE TOTAL</u>		:	<u>470 HOURS</u>

Below the objectives that relate to child abuse in the AEA curriculum have been placed and highlighted in the shaded box.

THEORY

7.1 PROFESSIONAL PRACTICE AND ETHICS

AIM:

Includes the cognitive and effective course content concerning the ethical and professional aspects of the ambulance practice

TOTAL HOURS: 5

CONTENTS:

7.1.1 ORGANISATION OF EMERGENCY MEDICAL SERVICES (EMS)

- Ethos of the profession
- The role of the Provincial Administration
- The role of private enterprise
- Policy making bodies
- Health Care System in the Republic of South Africa
- Applied legislation (relevant sections)
 - Health Act
 - Child Act
 - Traffic Act
 - Fire Act
 - HPCSA Act
 - Medicines and related substance control Act.

7.1.2 HEALTH PROFESSIONALS COUNCIL OF SOUTH AFRICA

- The function and role of the HPCSA
- The function and role of the Professional Board for Emergency Care Personnel
- The Medical, Dental and Supplementary Health Services Act 56 of 1974
- Regulations
- Scope of Practice
- Misconduct and disciplinary actions

7.1.3 THE DUTIES OF AN AMBULANCE EMERGENCY CARE ASSISTANT

- Preparation
- Response
- Safety
 - AEA and other personnel
 - Assistant
 - Equipment
 - Scene
 - Patient
- Patient Assessment
- Emergency Care
- Extrication
- Transportation
- Patient Transfer
- Records and Reports
- How to avoid legal litigation
- Medico legal risks and preventative measures.

OBJECTIVES:

- Demonstrate the infant and child CPR and obstructed airway management.
- Discuss psychological support and management in paediatrics.
 - Principles
 - Reasons
- Discuss the vasovagal reflex in paediatrics:
 - Dangers
 - Triggering in infants and children
- Discuss the following, their clinical picture and management:
 - Hyperpyrexia/fever
 - Croup
 - Epiglottitis
 - Meningitis
 - Encephalitis
 - Gastroenteritis, diarrhoea and vomiting:
- Pathological
- Idiopathic
- Malnutrition
- Dehydration including:
 - Fluid and electrolyte replacement
 - UNESCO universal formula
 - Colic
 - Hyaline membrane disease
 - Hypothermia
 - Hypoxia
 - Hypoglycaemia
 - Croup
 - Epiglottitis
- Discuss and describe the recognition and management of the high-risk baby.
- Discuss the recognition, clinical picture and emergency care of poisoning in children.

7.4.12 CRISIS INTERVENTION**CONTENTS:****7.4.12.1 ABUSED CHILD**

- Psychologically abused child
- Emotional
- Physically abused child
- Nutritionally and sexually abused child
- AEA: Legal obligation (refer to point 7.1.1)

7.4.12.2 SUDDEN INFANT DEATH SYNDROME**7.4.12.3 SPECIAL SITUATIONS**

- The dying - death counselling, care of the dying
- The suicidal
- Domestic incidents/violent
- Rape

7.4.12.4 SOCIOLOGY AND PSYCHOLOGY (Care of the caregivers)

- Stress and coping strategies
- Values and norms
- Mental health - mental illness
- Transactional analyses
- Defence mechanisms
- Conflict management

Appendix C: Conferences and Symposia, and ALS database

Conferences and Symposia, and databases

1. Resuscitation Council Symposium (RCSA)
Date: May 2016
2. Netcare Faculty of Emergency and Critical Care EPIC CPD day
Date: August 2016
3. Emergency Care Society of South Africa conference:
Date: August 2016 (this conference was not used as a method although planned, author did not attend)

ALS Database

Administered by Patrick Wallet, informal and voluntary database administered through mailing list, supplies information on opportunity and research requests to the registered members. Author did not have access to the members directly, rather the link was shared by the manager of the database.

For more information about this database and mailing list, please contact Patrick Wallet directly (patrick@careflight.co.za). Details listed with permission from Patrick Wallet.

Appendix D: Need's analysis questionnaire

Demographic Questions:

1. Please indicate your current age:
 - a. 18 - 25 years old
 - b. 26 – 35 years old
 - c. 36 - 45 years old
 - d. 46 – 55 years old
 - e. 55 - 63 years old

2. Gender
 - a. Male
 - b. Female
 - c. Unwilling to disclose

3. What is your highest qualification?
 - a. Ambulance Emergency Assistant
 - b. Emergency Care Technician
 - c. Critical Care Assistant
 - d. National Diploma Emergency Care and Rescue
 - e. Bachelor's Degree Emergency Care and Rescue
 - f. Master's Degree in emergency medical care and Rescue

4. What is your job title?
 - a. Operational Medic
 - b. Road Operations Manager
 - c. Lecturer
 - d. Flight paramedic
 - e. Administrator
 - f. Other: (please specify)

5. Please indicate your total years of experience in the Emergency Care field (since first employment in the field)
- a. 0 – 4 years
 - b. 5 – 8 years
 - c. 9 – 15 years
 - d. 16 – 20 years
6. How many years of experience do you have at your current qualification level?
- a. 0 – 4 years
 - b. 5 – 8 years
 - c. 9 – 15 years
 - d. 16 – 20 years
7. In what area of service do you perform the majority of your work?
- a. Government or provincial service
 - b. Semi Private Service
 - c. Fully Private Service
8. How many operational hours do you work per month (average)?
- a. 0 – 50 hours per month
 - b. 51 – 100 hours per month
 - c. 101 – 150 hours per month
 - d. 151 – 200 hours per month
 - e. 201 or more hours per month
9. Approximately how many infants do you treat/transport per month (average estimated)?
- a. 0 – 2 per month
 - b. 3 – 5 per month
 - c. 6 – 8 per month

- d. 9 – 12 per month
- e. More than 12 per month

Attitudes towards child abuse

10. Do you feel comfortable that you would be able to recognise a case of infant abuse from the clinical signs and symptoms (including history)?
- a. Yes
 - b. No
11. Have you ever participated in any training (since you qualified) regarding the recognition of abuse in the infant population?
- a. Yes
 - b. No
12. Have you ever participated in any training (since you qualified) regarding the reporting of abuse in the infant population?
- a. Yes
 - b. No

Perceived knowledge of practice related to child abuse

Answer the following question on the scale that follows:

13. I feel comfortable that I have enough knowledge with regard to the clinical presentation and manifestations of child abuse in the infant population to make a differential diagnosis of abuse.
- a. Agree strongly
 - b. Agree
 - c. Neutral
 - d. Disagree
 - e. Strongly disagree
14. I feel comfortable that I have enough knowledge with regard to the risk factors and history presentation of abuse in the infant patient to make a differential diagnosis of abuse.
- a. Agree strongly
 - b. Agree
 - c. Neutral
 - d. Disagree
 - e. Strongly disagree
15. Do you know the procedure for the reporting of a suspected case of infant abuse in your current setting?
- a. Yes
 - b. No

16. Are you aware of a clear reporting pathway for the suspected case of infant abuse in your current setting?

- a. Yes
- b. No
- c. Unsure

17. Are you aware of the laws and regulations that apply to the pre-hospital provider in terms of the reporting of cases of suspected infant abuse?

- a. Yes
- b. No

18. Who are the appropriate authorities for the reporting of suspected child abuse cases? (who would you approach to report a case of suspected abuse to?)

Select the option you feel best describes how you feel about the following statements:

19. I would report a suspicion of infant abuse

- a. Yes
- b. No
- c. Unsure

20. I have previously reported a case of suspected infant or child abuse to the appropriate authorities.

- a. Yes
- b. No
- c. Unsure

21. Have you ever suspected possible abuse and not reported this suspicion to the appropriate authorities?

- a. Yes
- b. No
- c. Unsure

22. I would feel comfortable to report a case of suspected child abuse in my current place of work

- a. Yes
- b. No
- c. Unsure

23. I think that a report filed about a case of suspected infant abuse would be well received and followed up by the appropriate authorities.

- a. Yes
- b. No
- c. Unsure

Knowledge with regard to the laws

For each statement below, choose the option you feel is most correct:

24. Prehospital Providers are required by law to report a suspicion of infant abuse

- a. Yes
- b. No
- c. Unsure

25. Only a medical doctor is required by law to report a suspicion of abuse
- a. Yes
 - b. No
 - c. Unsure
26. The death of an infant in the pre-hospital environment should always be investigated and handed over to the police for a post-mortem review
- a. Yes
 - b. No
 - c. Unsure
27. A diagnosis of SIDS (Sudden Infant Death syndrome) can be made in the pre-hospital setting
- a. Yes
 - b. No
 - c. Unsure
28. A suspicion of SIDS (Sudden Infant Death Syndrome) in the pre-hospital environment means that the death of an infant would NOT need to be investigated in a post-mortem review.
- a. Yes
 - b. No
 - c. Unsure
29. If I suspect infant abuse and I do not report it, I may be in breach of the laws of South Africa
- a. Yes
 - b. No
 - c. Unsure

30. If I find evidence of infant abuse and I do not report it, I may be in breach of the laws of South Africa.

- a. Yes
- b. No
- c. Unsure

The next five questions are case scenarios with a set of questions. For each case, you will be asked several questions.

Case Scenario 1

1. A 6-month old boy presents to the emergency department with both parents. The child has a bruise over the left forehead and is crying. The parents give a history of having put the baby chair up on a plastic table outside while locking the door to the house. The family have a large dog who is very excitable. As the baby was crying, the dog was getting more and more excited. The dog bumped the table and the baby chair landed on the floor face down with the child in it.

The parents immediately lifted the chair, loaded the chair into the car and drove to the hospital. Mom and dad both seem concerned and dad is pacing in the waiting room.

Clinical examination:

A healthy looking 6 month old boy, appears pale and is crying, although is easily consolable by his mother. He presents with a bruise over the left eyebrow, which is swelling rapidly, there is a small graze on the forehead too. The patient is still in his car chair as the family were too nervous to take him out of the chair.

There is a history of the patient being unconscious for about 20 seconds after the fall. The fall happened approximately 15 minutes ago (the family live approximately 12 km from the hospital)

Questions:

- a. Would you consider this patient presentation to be concerning?
 - a. Yes
 - b. No
 - c. Unsure

- b. Are you required to report this case as a possible case of abuse?
 - a. Yes
 - b. No
 - c. Unsure

- c. Which facts of the case above assist you in the decision you made above? Please comment to justify your answer.

Case Scenario 2

2. You are called to a local nursery school to assist a 3-year female patient with a possible fracture of the humerus.

History:

The teacher on duty at the school reports that she let the children out for lunch-time play, she was watching a group of children on the jungle gym platform when one of the little girls fell off it, landing with her arms out stretched in front of her. The child got up immediately and started running towards her with an obviously deformed arm. The child was crying uncontrollably and presented with severe pain over the arm. As soon as the injury was noted, the teacher called for assistance and the emergency number was called.

You have arrived approximately 5 minutes after that call for assistance.

Clinical examination:

A 3-year old female patient with an obvious deformity with bruising to the right distal humerus, the patient is guarding the injured arm and cries when anyone comes near her. She appears comfortable on her teachers lap and is very weary of EMS staff. The patient denies pain anywhere else on her body.

Questions:

- a. Would you consider this patient presentation to be concerning?
 - a. Yes
 - b. No
 - c. Unsure

- b. Are you required to report this case as a possible case of abuse?
 - a. Yes
 - b. No
 - c. Unsure

- c. Which facts of the case above assist you in the decision you made above? Please comment to justify your answer.

Case scenario 3

3. A 3-month old boy presents to the emergency department with both parents.

A paediatrician has called for a transfer of a 3-month old boy from his rooms to the paediatric ICU. The patient was brought in to the paediatrician's rooms this morning with a 2-week history of apnoeic spells while feeding . The baby had a prolonged apnoeic spell this morning during his 3 AM feed and mom reports the child was noted to be cyanosed and jerked for about 20 seconds. There is no history of trauma or other adverse events by the parents.

The infant presents with lethargy, the infant is irritable and not responding as expected for age, he appears very sleepy. The infant has a swelling within the left orbit, which is causing the left eye to protrude slightly. The patient did seize for 10-15 seconds in the paediatrician's rooms, which is why he called for assistance. The doctor reports that there is evidence of retinal bleeding in the left eye.

The infant has an increased, irregular respiratory rate and increased heart rate for his age.

- 3.1. Would you consider this patient's presentation to be concerning?
- a. Yes
 - b. No
 - c. Unsure
- 3.2. Are you required to report this case as a possible case of abuse?
- a. Yes
 - b. No
 - c. Unsure
- 3.3. Which facts of the case above assist you in the decision you made above? Please comment to justify your answer.

Case Scenario 4

You have been called to a flat in the inner city to assist a 2-year-old female. On arrival, there is no one who comes to meet you, eventually you find the flat number and a young adult male greets you and shows you to the child's bedroom. The child is in a cot in the middle of the room, she is crying uncontrollably. The caretaker tells you he heard crying while the child was supposed to be napping, he found the child on the floor next to the cot, he assumes the child fell out.

Clinical examination

You find a thin 2-year old girl who holds out her arms for you to pick her up when you arrive., You notice the child is in a nappy only and that the flat's conditions are squalid. The child is guarding the right leg and cries when the femur area is palpated. You notice crepitus on palpation. There is a small amount of dried blood present on the child's lips. There are blue, yellow and brown bruises noted on the posterior chest and sternal area.

- 4.1. Would you consider this patient presentation to be concerning?
 - a. Yes
 - b. No
 - c. Unsure

- 4.2. Are you required to report this case as a possible case of abuse?
 - a. Yes
 - b. No
 - c. Unsure

- 4.3. Which facts of the case above assist you in the decision you made above? Please comment to justify your answer.

Case scenario 5

You are called to a house in the suburbs for an 18-month old baby who is not breathing; it is 15H00 in the afternoon. The house appears to be an informal day care centre.

History:

The day mother reports that the baby went down for a nap at approximately 14H00 after his feed; he did not complete the feed before he fell asleep. The child was wrapped in a blanket in the warm room wearing only his nappy and placed on a foam wedge to keep him in a lateral position. The day mother did not check on the child until the mother arrived to fetch him. She reports no fevers or illness other than the feed that was not finished.

Clinical examination

On examination, you find an overweight infant with no brachial pulse. You notice stiffening in the shoulder and knee joints consistent with rigour mortis. There is no obvious evidence of trauma.

- 5.1. Would you consider this patient presentation and history to be concerning?
 - a. Yes
 - b. No
 - c. Unsure
- 5.2. Are you required to report this case as a possible case of abuse?
 - a. Yes
 - b. No
 - c. Unsure
- 5.3. Are you required to report/refer this patient for a post-mortem assessment? (Autopsy)
 - a. Yes
 - b. No
 - c. Unsure
- 5.4. Which facts of the case above assist you in the decisions you made above?
Please comment to justify your answer.

Appendix E: Expert review

SAABI Expert Group

- Reviewer 1: MSc Candidate in Child Neuro-development Course, Convenor of the Johannesburg Child Advocacy Forum
- Reviewer 2: MA Research Psychology, Consulting Researcher
- Reviewer 3: BA (Hons) Social Work, Social Worker at Impilo Child Protection Services

Comments from the expert reviewers about the content validity of the questions and cases

Case 1: Good case study, small index of suspicion, but how the injury occurred may concern a social worker.

Case 2: Good, again a small index of suspicion, but lack of adult supervision is concerning

Case 3: Good, concerning because no history, delayed reporting, medical findings.

- Question 2 is complicated for EMS in this case, because whose responsibility is it to report it? Is it within the Netcare system, or a private practice?
- Look at adding further questions:
 - Whose responsibility is it to report it?
 - To whom should it be reported?
 - What is the EMS's role in reporting this case?

Case 4: Good Case, most clear case of abuse.

- Additional question: what type of abuse is it?

Case 5: Typos. Unexplained child death.

- If the intention is to show the inconsistency in history this is a good example
- Maybe clarify referral to a “STATE” mortuary/pathologist?
- In addition to question 2, to whom are you required to report it?

Overall, everyone thought that they were all good, well rounded case studies, that covered the various aspects of suspicion and reporting.

Education Reviewers

Comments from the expert reviewers about the face validity of the questions and cases

Table 7.1: Qualifications of the reviewers of the questionnaire

	Reviewer 1	Reviewer 2	Reviewer 3	Reviewer 4
Qualification	BTech EMC + PGD HSE	BT(EMC)	CCA	B- Tech:EMC
Years of Experience in Education (years)	3	6	3	3
Years of Experience in EMS (years)	7	10	8	9

Table 7.2: Assessment of the questions by the reviewers

Questi on	What do you think is being asked? (general info/knowledge/perception/attitude)			
	Reviewer 1	Reviewer 2	Reviewer 3	Reviewer 4
1	Demographics	Age: gen info	Age - Perhaps applicable to experience/expo sure	Demograp hics
2	Demographics	Qualification: gen info	Qualification - Perhaps applicable to experience	Demograp hics
3	Demographics	Job description: gen info	Job title - Exposure to certain instances	Demograp hics
4	Demographics	EMS experience: gen info	Years of experience - Same as above	Demograp hics
5	Demographics	Qual experience: gen info	Years of experience at current level of	Demograp hics

			qualification - Same as above	
6	Demographics	Sector: Gen info	Area of service	Demograp hics
7	Demographics	Average op hours/month: gen info	Operational hours worked per month - Likelihood of dealing with child abuse instance	Demograp hics
8	Demographics	Average infant exposure/mont h: gen info	Infants treated/transport ed per month - Ability/experienc e in identifying child abuse instance	Demograp hics
9	Knowledge and attitude	Abuse recognition: perception & attitude based on current knowledge	Recognition based on S+S of abuse - Relative to experience and exposure to these cases	Abuse recognition
10	Knowledge	Training in recognition: knowledge	Training regarding recognition of abuse - Whether training in this is available or not	Training in recognition of child abuse
11	Knowledge	training in abuse reporting: knowledge	Training regarding reporting of abuse - Same as above	Training regarding reporting structures
12	Knowledge	Interpreting own knowledge & competence in diagnose abuse from physical assessment: perception	Differential diagnosis of abuse based on clinical presentation and manifestations	Diagnosis of abuse in infant and practitioner comfort
13	Knowledge	Interpreting own knowledge & competence	Differential diagnosis of abuse based on	Identificatio n of risk to

		in diagnose abuse from history (perception)	risk factors and history	infant for abuse
14	Knowledge and general info	Reporting lines/policies: knowledge	Procedure for reporting a suspected case of abuse	Reporting structure awareness
15	Knowledge and general info	Reporting pathway (bottom to top): Knowledge	Awareness of a clear reporting pathway - Great question!!	Reporting structure in place or in use
16	Knowledge and general info	Knowledge of legal requirements for healthcare providers duties around abuse: knowledge	Laws and regulations	Law related to prehospital practitioners
17	Knowledge and general info	Knowledge of authorities: knowledge	Appropriate authorities for reporting	Who will the practitioner inform when abuse is occurring
18	Attitude	Intention to report: attitudes	Likelihood that a provider would report a case/suspicion of abuse	Willingness to report
19	Attitude	History of previous reporting incident(s): general info	Previously reported a case of child abuse - Are these cases being reported?	Actual cases reported
20	Attitude	Admission of failure to report: general info	Suspected child abuse and haven't reported it	Encountered abuse and not reported
21	Knowledge	Confidence/comfort in reporting: perception/attitude	Comfortable to report a case of child abuse	willingness to report without fear

22	Knowledge	Potency of reporting: perception of authority's attitudes to and impact on abuse	Reported case to be followed up by authorities	Perceptions of the system once case is reported
23	Knowledge	Law: knowledge greying into perception	Required by law to report suspicion of infant abuse	Conditions that require reporting by EMS
24	Knowledge	Law: knowledge greying into perception	Only a Med Dr required by law to report suspicion of abuse	Conditions that require reporting by doctors
25	Knowledge	Law: knowledge greying into perception	Pre-hospitally, all infant deaths need to be reported to SAPS - Emphasis to be placed on reporting	Procedure following death of an infant
26	Knowledge	Law: knowledge greying into perception	SIDS diagnosis can be made pre-hospitally	Can pre-hospital practitioner s diagnose SIDS
27	Knowledge	Law: knowledge greying into perception	If SIDS, no investigation pre-hospital (Might be surprised by the frequency of this)	Procedure related to SIDS in pre-hospital environment
28	Knowledge	Law: knowledge greying into perception	In breach of SA laws if you do not report the suspicion of infant abuse	Law and unreported abuse
29	Knowledge	Law: knowledge greying into perception	In breach of SA laws if you do not report the evidence of infant abuse	Law and unreported abuse

Question	Reviewer 1	Reviewer 2	Reviewer 4
1		The dashes aren't all the same, some are short, some are longer.	Various length age-ranges (4,5&6 years)
2	d and e - Diploma / degree <u>IN</u>	Distractor f says Masters in....	
3	Use either Medic / Paramedic (A vs D)		Limited list
4	field' in Emergency Care field in capital?	asks "since employment" - this would exclude volunteering prior to employment. What about experience while still studying?	
5			
6	a - provincial in capital		
7		your first option for both questions includes 0. This may decrease the sensitivity of this band of practitioner. Would suggest that 0 hours / 0 infants per month be offered as a stand-alone option.	
10		"since you qualified" could be interpreted as since completing my most recent course/qual - is this what you mean? Or do you mean since becoming operational?	Develop a training programme for EMS based on feedback provided from this question

12		For the Likert options, your grammar differs for option 1 and 5: Agree Strongly vs. Strongly Disagree	
13			Possibly reword the question to emphasize risk factors?
14		Has "Unsure" been left out intentionally?	Reporting procedure not clear enough for most EMS providers
15		As above	
16		Has "Unsure" been left out intentionally?	Providers often fear implications that may follow reporting, reluctance to get involved as a result. Perhaps providers can be educated on correct reporting process to avoid this
17	the sentence in brackets - remove the 'to' at the end of the sentence. Who with capital?	Do you want these listed in order of priority or preference? If so, this would need to be specified	Inform providers of various authorities to whom they can report a case to, dispatch to get involved
18		Full stop at the end of sentence	
19		"Unsure" is superfluous - the question is an absolute: either they have or haven't	Very interesting to see the outcome of this question
20		As above - remove "unsure"	
21	Is it anonymous?	Full stop at the end of sentence	
23		Full stop at the end of sentence	
24	SIDS written out in 23 and 24 different	Sudden Infant Death Syndrome (syndrome in capital or not?)	Full stop at the end of sentence

25	Full stops at the end of the sentences	Full stop at the end of sentence	
26		Full stop at the end of sentence	Perhaps add cot death for the longer qualified practitioners who haven't updated
27			
28		Full stop at the end of sentence	Maybe highlight suspect and evidence as I misread the questions initially
29			

Table: 7.3: Case review comments from expert reviewers

Case 1			
	Comment on the case structure	Is there any more information you would like to have?	What do you consider the aim of this case to be?
Reviewer 1	Full stop at end of last sentence.	No	Don't look for something that isn't there.
	Spacing of paragraphs between hx and clinical presentation, etc.		Not all infants with trauma injuries is abuse.
			Take ALL the info into account.
Reviewer 2	Very good	N/A	Respondent's ability to differentiate abuse from accident
Reviewer 4	Clear, adequate information	Possibly the state of the chair and clothes of the infant	whether practitioner can determine when to report
	Questions labelled as a, b, c,	the hygiene etc	a case or if they can identify the case
	rest of cases labelled with numbers		

Case 2			
	Comment on the case structure	Is there any more information you would like to have?	What do you consider the aim of this case to be?
Reviewer 1	Spacing between sections makes read easier.	No	Accidents happen?
Reviewer 2	Very good	Parents have been notified?	Respondent's ability to differentiate abuse from accident
Reviewer 4	Clear	Possibly the state of the chair and clothes of the infant	Make a judgement on the fitness of the teacher to
	Nothing ambiguous	the hygiene etc	look after children and if she was neglectful
	Questions labelled as a, b, c,		
	rest of cases labelled with numbers		

Case 3			
	Comment on the case structure	Is there any more information you would like to have?	What do you consider the aim of this case to be?
Reviewer 1	Case layout different to 1 and 2. No headings of history and clinical presentation.	Nothing	Just because the doctor (higher qualification) doesn't
	? Keep the format universal?		seem concerned, doesn't mean you don't have to be.
Reviewer 2	Very good	Patient is brought in by who?	Respondent's ability to differentiate abuse from medical condition
Reviewer 4	Clear	Possibly comment on the infant's body shape and size	To identify the possibly abuse due to parents either
	Justify paragraphs		not being well informed
			Shaken baby?

Case 4			
	Comment on the case structure	Is there any more information you would like to have?	What do you consider the aim of this case to be?
Reviewer 1	Full stop and comma end of sentence 1 under clinical exam.	No	Don't only focus on injuries most likely sustained NOW - child abuse usually surfaces when it's been ongoing for a while.
Reviewer 2	Good	This case seems heavy handed in pointing to abuse.	Recognition of abuse.
		You may consider "taking away" elements of the presentation	
		Depends if you are gauging sensitivity/threshold levels of the respondents	
Reviewer 4	Justify paragraphs	No report	Willingness of child to go to a stranger and not caretaker

Case 5			
	Comment on the case structure	Is there any more information you would like to have?	What do you consider the aim of this case to be?
Reviewer 1	Start of paragraph is numbered 5 as well as heading.	This case seems heavy handed in pointing to abuse.	SIDS can't be diagnosed pre-hospitally.
	spacing between 5.3 and 5.3	You may consider "taking away" elements of the presentation	
		Depends if you are gauging sensitivity/threshold levels of the respondents	
Reviewer 2	Good		Differentiation between abuse and SIDS
Reviewer 4	Clear Justify paragraphs Huge gap between 5.3 and 5.4 Formatting between 5.2 and 5.3	Time mother arrived/ length of nap	To identify the possibility of SIDS
			Neglect from day mother

Appendix F: Online Course Content

The online intervention is best viewed online at the following website:

<https://netcare-education-fecc.usefedora.com/courses/recognition-and-reporting-of-physical-abuse-in-the-infant-patient/lectures/2183629>

The online intervention followed the structure as laid out below:

Module 1: What is abuse and why are infants at such high risk?

- What is abuse?
- How big is the problem?
- Why are infants at such high risk?

Module 2: South African Law protecting infants

- The constitution
- The role of the Bill of Rights
- The Children's Act (Act 38 of 2005)

Module 3: Recognising abuse in the infant patient

- Elements that place the infant at risk
- Elements in the history that place the infant at risk
- Elements in the clinical examination that place the infant at risk
- Information that should be documented in a suspicion of abuse case

Module 4: Reporting a reasonable suspicion of abuse

- The paperwork and asking for help
- The link to the questionnaire

The tool presented in the online intervention to guide the questions to be asked in a case of abuse and the clinical assessment that should be performed.

Medical Condition	Yes	No	Description
Blood Disorders Coagulation disorders Von-Willabrand's Disease Haemophilia Scurvy HIV/Hepatitis Impetigo			
Bone Disorders Osteogenesis imperfect Rickets/Vitamin D deficiency			
Skin disorders Eczema Haemangiomas Mongolian Spots Allergies or skin reactions Epidemolysis Bullosa Lichens Sclerosis et Atrophicus			
Neurological Disorders Seizures or Epilepsy Hydrocephalus Cerebral palsy			

Meningitis/Encephalitis			
Other Problems Ehlers Danlos Syndrome Marfan's Syndrome Inborn errors of metabolism Malignancy/Cancer Vasculitis Poison or other toxic ingestion Alagille's syndrome			

This section should be completed by the parent/caregiver

Does the child currently, or has the child ever suffered from the following (where the answer is yes, please document a description of the condition and timeline):

Declaration

The information contained above is true and correct as far as I am able to recall and report, the information contained above has been accurately recorded.

Name: _____ **Signed:** _____

Parent/Caregiver (please circle appropriate)

Date: _____ **Witness** _____

Please tick the appropriate Mechanism of Injury (where appropriate document specifics)		
Motor Vehicle Accident	☐	
Pedestrian Vehicle Accident	☐	
Falls	☐	
Falling object	☐	
Accident while playing	☐	
Sibling or other child caused harm	☐	
Other	☐	
Unknown	☐	

If trauma present, the caregiver/parent should complete the following checklist:

Scene overview (areas for comment noted on the left margin)	
Environment of the scene (inside/outside, weather conditions, hazardous objects/situations, area and initial position of the child, caret/tiles/paving, supine/prone/lateral)	
Persons present on the scene at the time of the injury/illness (list all present)	
Evidence of the child's living conditions (comment on clothing, hygiene, safety, pets or animals present, if infant check diaper) Please detail any relevant additional information	
Child's nutritional status (Weight and age of the child, does the child appear well nourished, evidence of appropriate feeding practices for age? Hair and skin condition, teeth)	
In the case of trauma: describe the mechanism of the injury	
In your opinion, does this correlate with the age/developmental ability of the child?	
Detailed head to toe examination (this should be in addition to the examination on your patient report form)	
Abnormalities Found (detail anatomical area and describe the abnormality)	
Head and neck Ears (bruising/abrasions) Fontanelles (bulging or sunken) Frenulum (lips) Gums (bruising/teeth missing) Eyes (petechial bleeding) Bruising to face or neck	
Chest Air-entry (crackles/rhales) Difficulty breathing/increased RR Bruising or pain on palpation	
Abdomen, buttocks and genital area Bruising/guarding	
Limbs Bruising, swelling, marks Previous fractures Burns/scalds Abrasions/open wounds Buttocks/genitalia (bruising or injury)	

Appendix G: Ethics Clearance Certificate



R14/49 Mrs Kayleigh Lachenicht

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)

CLEARANCE CERTIFICATE NO. M160413

NAME: Mrs Kayleigh Lachenicht
(Principal Investigator)
DEPARTMENT: Centre for Health Science Education
Netcare Education Faculty of Emergency and
Critical Care

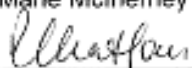
PROJECT TITLE: Development and Effect of an Online Educational
Intervention "on the Knowledge, Skills and Attitudes
of the Pre-Hospital Care Worker in South Africa Towards
the Assessment and Reporting of Abuse in the
Infant Patient

DATE CONSIDERED: 06/05/2016

DECISION: Approved unconditionally

CONDITIONS:

SUPERVISOR: Prof Patricia Anne-Marie McInerney

APPROVED BY: 
Professor P. Cleaton-Jones, Chairperson, HREC (Medical)

DATE OF APPROVAL: 29/06/2016

This clearance certificate is valid for 5 years from date of approval. Extension may be applied for.

DECLARATION OF INVESTIGATORS

To be completed in duplicate and **ONE COPY** returned to the Research Office Secretary in Room 10004, 10th floor, Senate House/2nd floor, Phillip Tobias Building, Parktown, University of the Witwatersrand. I/We fully understand the conditions under which I am/we are authorised to carry out the above-mentioned research and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated, from the research protocol as approved, I/we undertake to resubmit to the Committee. I **agree to submit a yearly progress report**. The date for annual re-certification will be one year after the date of convened meeting where the study was initially reviewed. In this case, the study was initially reviewed in April and will therefore be due in the month of April each year.

Principal Investigator Signature

Date

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

Appendix H: Study Information Sheet/Letter to the respondent

Study title:

Development and effect of an online educational intervention on the knowledge, skills and attitudes of the pre-hospital emergency care providers in South Africa towards the assessment and reporting of abuse in the infant patient.

Good day,

Introduction:

I, Kayleigh Lachenicht am a paramedic lecturer registered for a Master's degree in Health Science Education at the University of the Witwatersrand. In this study, I want to learn about the pre-hospital emergency care providers' experience and knowledge of the recognition and reporting of infant abuse in the pre-hospital setting. I also want to learn if these factors can be affected by an online learning intervention (course) that teaches about the abuse of infants and the management of these patients.

There is very little research in this field.

The following are some questions you may have about participating in this study.

What are the expectations if I choose to participate?

If you choose to participate in the study, you will be invited to complete a questionnaire that will take approximately 30 minutes to complete. This questionnaire will be available online and will accessible from any device with an internet connection, it can be completed at your convenience and you will be able to return to the questionnaire if you do not complete it. This questionnaire will ask questions regarding demographics (information about you and your experience and qualification/s), and your knowledge with regard to the recognition and reporting of abuse.

If you decide to continue with the study, you are invited to participate in an online learning intervention, which will take the form of a 2-hour self-directed online programme that addresses the problems identified in the initial questionnaire.

This will be made available approximately 4-6 weeks after completion of the pre-intervention questionnaire. Once you have completed the online lesson, you will then be asked to complete a final questionnaire to determine if the educational intervention was helpful. This questionnaire is expected to take about 20 minutes to complete.

Are there risks to participation in this study?

Due to the sensitive nature of the questions being asked in the questionnaire, there is the possibility that you may feel uncomfortable or unable to continue with answering the questions. In this case, there is the option to stop the questionnaire immediately, and initiate the “distress protocol” if you choose not to continue.

Are there benefits to participation in this study?

By participating in this study, you will be assisting with determination of the problem areas in the learning and teaching of this important subject. You will benefit through the interaction with the online learning programme and will exit the study with a potentially better understanding of the recognition of infant abuse in the prehospital setting and the reporting of this abuse.

Informed Consent

By answering the questionnaire online, or in paper form, you will be consenting to participation in this study

Do I have to participate in this study?

No, participation in this study is voluntary. Refusal to participate will NOT involve any penalty.

If at any point, you decide you no longer wish to participate in the study, you are free to end your participation without comment or explanation and without penalty.

There is no financial reward and there are no costs for participation in this study.

Confidentiality:

All personal information will be kept confidential, you will not be required to place identifying data in the demographic questionnaire (your name, ID number or HPCSA number will not be asked)

In order to complete the educational intervention and follow up questionnaire: at the end of the first questionnaire you will be asked to enter an email address; this will be on a separate page and will not be related to the initial questionnaire.

Only participants who enter this information will be asked to participate in the second part of the study.

Absolute confidentiality cannot be guaranteed. Only the researcher will access the information, if results are published, the information reported on will not allow for the individual identification of participants.

For any further information or to report adverse events, please contact me on the following number: 0102098383.

For any further information, you may contact my supervisor Assoc Prof. P. McNerny in the Centre for Health Science Education at the University of the Witwatersrand (011 717 2073).

If you have any ethical questions or concerns, please contact the chairperson of the Wits Human Research Ethics Committee, Prof P Cleaton-Jones on 011 717 1234 or at zanele.ndlovu@wits.ac.za. The HREC reference number for this protocol is:

Reference: R14/49, Protocol number: M160413.

Thank you for taking the time to read this information sheet. If you agree to participate in this study, please click the “next” button below and read and accept the consent form in the next section.

Kind Regards

Kayleigh Lachenicht

Btech EMCR (DUT)

Appendix I: Stress Protocol

This notice appeared at the start and end of the questionnaires (both pre- and post-intervention), participants will also have access to the distress protocol in the educational intervention.

If at any point in this questionnaire or the process of the data collection for this study you feel you are unable to continue due to emotional distress or discomfort, the following steps are advised:

- Immediately stop the questionnaire or intervention
- Click on the “Distress protocol” option at the bottom of each page
- Access the contact details in order to access help

You are under no obligation to complete the questionnaire or the educational intervention, and it is important that you know that there is help at hand if you feel uncomfortable, distressed or in need of help.

The following contact details can be used to reach out for assistance:



tracykrugerpsychologist@gmail.com
cell 063 694 2756
ps 012 7205

practice number
086 001 062 7941

Appendix J: HPCSA Statistics received from the HPCSA

The following information represents those registered as independent practitioners on the Board of Emergency Care with the HPCSA (Health Professions Council of South Africa), the total number of people registered as independent practitioners countrywide on this board is 13 366. This is an updated version of the information that the sample calculation was based on (HPCSA, 2018).

Table 7.4: 2018 HPCSA statistics from the May 2018 annual report

Ambulance Emergency Assistant	10085
ANT (Paramedic)	1522
ECP (Emergency Care Practitioner)	633
Emergency Care Technician	1126

Adapted from the HPCSA annual statistics reported May 2018

Table 7.5: Age of HPCSA practitioners registered as any of the following: ANA, ANT, ECP, ECT

Age	<30 years	30-39 years	40-49 years	50-59 years	60-69 years	>70 years
Number	1751	7675	4557	1833	239	14
Percentage	11%	48%	28%	11%	1%	0%

Appendix K: Comments for case in the questionnaire

The information below is unedited, as it was captured by the respondents in the study

Table 7.6: Case One Comments

	Response ID	Which facts of the case above assist you in the decision you made above- Please comment to justify your answer.
1	20	Concern from the parents about the patient's safety. Injuries matching the history. No other signs of abuse.
2	21	Incident 15min and 12km indicate parents rushed patient for treatment Strapped in chair indicate concern for further injuries Placing patient on chair indicate attempt to keep child away from dog initially No other injuries found easily consoled by mother
3	22	The injuries are consistent with the history. No other injuries reported on the case report.
4	26	History is consistent with the presentation and there was no apparent delay in seeking care
5	28	Baby is otherwise healthy, no reports of other injuries and is consoled by the mother. Timeline seems to fit too.
6	29	Single wound in single localized area Genuine concern and precautions taken by parents. Healthy baby & consolable by mother
7	31	1) The rush to hospital 2) baby is consolable by the mother does not seem to be afraid 3) Small graze on the forehead as well as the bruise I would like to find out more details in order to raise suspicion
8	33	The injuries are consistent with the history give. The child otherwise appears to be health He is easily consoled by his mother, showing that he is comfortable with her The parents appear to be showing true concern. Time line and distance travelled match up, good history.
9	34	The history of the fall appears strange and since the patient has not been assessed further it would be too early to report child abuse. However suspicion should be present and further investigations should be conducted such as skeletal X-rays, full examination as well as interview of parents separately.
10	36	Baby chairs don't just fall over if bumped. they are designed to be stable and it is very unlikely that the chair would just fall. also, that fact that the parents put it on top of the table and left it unattended were the dog could bump it off.
11	37	Child is not scared of the mother, dad seems concerned. Child still in car seat
12	39	The parents seems very concerned, the wounds seem to match the story and isolated wounds, the distance to hospital and time taken seem like they rushed the patient to hospital
13	44	Child is easily consoled by mother, no older injuries reported. Father is anxious about child. Parents were concerned enough to leave child in car seat and brought child to hospital immediately

14	55	The story, the timeline, parents concern and demeanour. The fact that they didn't want to take child out of chair in case of further injury (true concern for well-being)
15	56	Bruise over the left eye, why the baby chair was put high up on a table, the baby is crying for no reason, a dog that is so excitable is allowed to be around the baby
16	58	I am unsure as I feel there is not enough evidence to make a decision that there is any form of abuse going on. I would want to do a complete secondary survey to establish if there are any other injuries, new or old.
17	61	parent's behaviour, the? history of the incident, the fact that they transported the child immediately
18	65	Fam
19	66	Both parents present and concerned and child consolable
20	75	Involved parents, dual parent arrival, plausible story, child seeks comfort from parents, patient in car seat (i.e. cared for, safety-oriented parents), single injury, the child was rushed straight to hospital.
21	77	Story of a dog getting more excited as the baby cries - does not "add up." Patient is unconscious for 20 seconds - an upset of the chair by the dog would likely not cause such a hard impact with the ground that the child would lose consciousness.
22	80	SINGLE BRUISE. NO OTHER NOTABLE BRUISES OR UNRELATED INJURIES NOT SUBSTANSIATED BY THE MECHANISM OF INJURY
23	81	There were no other injuries noted. Child not scared by his mother, as she could console him quickly. Time to hospital seems reasonable due to distance to hospital
24	83	Concerning appearance because child is pale and bruising is swelling. However, child isn't afraid of his mother, I'd still check the child's whole body. Having said that parents may look concerned because of the fear of getting caught out.
25	88	Unsure. Depending on the parent's response and body language a decision can be made.
26	93	Parents immediately brought child to hospital and as per narrative seem concerned and upset. Parents are wary to remove child from seat. All above suggests genuine fear for safety of child.
27	97	Rapid transport, concern for the child, baby calms down with mom. No mention of other injuries
28	101	the child is comfortable around both parents and it doesn't seem as if the child is afraid of any of the parents
29	108	Concerned parents will leave their children as is in the chair. Their presentation can also show their concern of the well-being of their child. No foul language or fights being recognised in the ER. And take roughly the time of getting to hospital from home including stops and robots they did really go fast to get to hospital.
30	109	negligence
31	112	The bruise on the arm if the child was in the car chair I doubt the arms would be bruised

32	113	Nervous to further harm baby Dad nervous in waiting room for time History and diagnoses correlate
33	114	Child only has one bruise across his face, no other bruises on his body, he gets easily consoled by the mother, and they immediately drove to the hospital
34	116	parents seem concerned, took them 15 mins to get to hospital while they stay 12 km away
35	117	It's the first occurrence.
36	123	The unconsciousness of a baby is always concerning. parents are concerned and brought the baby in immediately. Injuries tired up with the story. The baby is easily consulted by mom. If the baby was abused it would not want to go to parent
37	126	I would not have a high index of suspicion of abuse based on the history as provided. The story appears plausible, the child appears to be comfortable in the mother's presence, the time frame from injury-medical care is decent and the parent's actions are logical and expected. I would however perform a thorough physical examination of the child and look for any pattern of abnormal injuries (old injuries to places other than "knees and elbows" so to speak).
38	130	The child has bruising on arms and been shaken like that land up with a coup counter coup injury resulting in brain injury
39	131	If there are no other signs of abuse and only the mark on the forehead then I don't see a reason to suspect abuse unless the hospital can confirm previous times that the child was seen with injuries and still occurs
40	136	The baby is a Healthy-looking baby, and is easily consolable by his mother. injuries do seem consistent with the story provided. there is not too much detail, as often made-up stories have a lot of details in them. also, travelling to the hospital straight after the incident, can take +- 15 minutes to do 12km. Also the swelling is still happening, meaning it happened roughly when the parents said, and not a while ago.
41	135	History is clear, no other injuries noted. Infant responding well to his mother. both parents seem concerned.
42	139	Child is healthy Easily consolable by mother Apparent immediate transportation to hospital - 12km in 15 minutes and bruise swelling rapidly indicates recent injury
43	140	The child is easily consolable by the mother; both parents seem concerned, and they brought the child into the hospital in his seat right after the accident happened
44	141	The injury of the infant appears to be consistent with how the baby fall. The parents attentively responded to hospital as the incident happen and the baby is healthy which means the patient has been well looked after.
45	145	Child is healthy looking. The mechanism of injury fits the scenario presented by the parents. Child is easily consolable by his mother depicts that he bonds well with her.
46	149	Pt easily consolable, no hx or visible signs of previous abuse mentioned. Both parties were described with 'symptoms' of concern.
47	152	The presentation of injuries may correspond with the history and there are no other signs of old or previous bruising marks on the body.
48	153	Only a single bruise present.

49	157	Injuries consistent with story Easily consolable by mother Father is pacing, and mom concerned
50	158	Both parents appear to be generally worried and concerned. Baby is not nervous around mom and is easily comforted by her. The story is a very realistic situation and they drove baby immediately to hospital.
51	160	The baby was left unattended at heights while crying even though he is well cared for and have a good relationship with the mother.
52	161	The boy was left unattended on heights while crying even though he has a good relationship with the mother and is cared for well otherwise.
53	162	The infant was immediately rushed to the hospital, the parents both seemed concerned and worried. The infant is comfortable with his mother consoling him. The family have taken precautions to not further harm the infant.
54	163	No other history of the patient going to hospital. The child looks healthy. The family is pacing and concerned.
55	164	Due to the time it took them to get to hospital and the distance I would say it was an accident as transportation was rapid and they took the baby to the hospital. The injuries consist of a fall with graze marks. There is no other evidence of abuse.
56	165	Obvious fresh wound. Concerned parents and child consolable
57	169	The swelling is recent and apart from the graze there are no other old injuries. The story is odd but plausible
58	171	The story seems to be credible - The child is healthy and no other injuries are noted. The child is easily consoled by the mother - the distance from the home to hospital correlates with the time frame given by the patient - They are concerned enough not to have moved the child from the car seat
59	177	It seems it's the family's 1st child and they made a mistake and placed the child strapped in a car chair on an unstable table. The baby is still small so therefore the parents are still learning. We are not taught how to be parents at school, it's not a subject you can take, and we learn by our mistakes. The fact the child is still strapped in shows that they were genuinely concerned and surely if it was a lie the child would've been in the parent's arms. There is also no mention of the child having been to the ED before and with it already being 6 months if abuse was happening surely this wouldn't have been the 1st occurrence.
60	178	Story seems to tie in with presentation. Seem to be no other signs of injury. Wound still swelling possibly new onset of injury as parents have indicated
61	179	The fact that the patient reached the hospital in a timely manner and was not removed from the car seat shows that the parents are well educated and do not impose any further harm to the child, although the fact that the parents are well educated should not necessarily lower the suspicion of abuse, furthermore the child seems trusting of the mother as he is easily consoled by her.
62	180	Knowing that the dog is very excitable, they still leave the child unattended in the presence of that same dog... Its negligence.
63	182	Plausible hx, no suspicion
64	188	To be sure a thorough interview with BOTH parents, separate, is required.
65	189	Concerned as bruise is still swelling. Injuries consistent with story. Parents behaviour appropriate, timeline works- they didn't delay treatment

66	202	- the child appears healthy - the child is easily consoled by the mother -the father is pacing in the waiting room
67	207	Child is easily consoled by mother, shows that he is not frightened of her. Time from incident to being taken to the hospital is minimal. There was no delay. Child was not removed from seat which showed concern for safety/injuries following incident from the parents. Parents seem genuinely concerned and not distant. Child is healthy looking.
68	212	Although the infant got hurt he is otherwise well cared for and has a good relationship with the mother. It is concerning that he was left at heights on his own.
69	213	Concerned parents, Rapid response to Hospital by parents.
70	217	The parents locked the door while the baby was outside alone. I would inform the doctor. And hope that he will follow the right channels to report or investigate.
71	218	Mom and dad both seem concerned and dad is pacing in the waiting room. although is easily consolable by his mother. The patient is still in his car chair as the family were too nervous to take him out of the chair. Taking into account the distance from home to casualty, the driver must have been driving quite fast to get to the hospital. (Taken from personal experience as first responder. 1km over 1 min)
72	220	Yes. The child has a bruise over the left forehead. The parents give a history of having put the baby chair up on a plastic table outside while locking the door to the house. The family have a large dog who is very excitable. As the baby was crying, the dog was getting more and more
73	222	Would have to see how the parents are acting and see the child and injuries

Table 7.7: Case two comments

	ID	Which facts of the case above assist you in the decision you made above- Please comment to justify your answer.
1	20	The injury matches the mechanism. The child ran to the teacher and feels comfortable with the teacher. EMS was called immediately after the injury.
2	21	No other injuries Child comfortable with teacher Rapid call for assistance Normal for children to be weary of strangers EMS
3	22	Nothing suspicious with regards to the history. The injury is consistent with the history.
4	26	Hx consistent with presentation and no delay in seeking medical assistance
5	28	If patient fell with outstretched arms you would expect a wrist fracture not humerus fracture.
6	29	Single wound consistent with mechanism of injury. Obviously distressed only after the incident Comfortable with teacher Immediately called for help
7	31	Again, I feel the evidence is not suggestive of abuse, I would develop a relationship with the kid and ask the kid straight up what caused her injury.
8	33	Child is comfortable with the teacher, if the teacher was the one to hurt her the child would not be comfortable to sit with the teacher. Injuries consistent with the history. No signs of any other injuries. Teacher appears to have been supervising the children so no signs of neglect present
9	34	The history received, and mechanism of injury do make sense, as for the child's behaviour, usually in my experience they are frightened of people in uniforms. Further examination as well as parent information would be necessary however I would consider this a low suspicion instance of abuse. I am unsure of school regulations for child monitoring during play time and as such cannot comment whether it was neglect.
10	36	often children fear ems staff as we wear bright clothing and protective gear, this isn't normal for them, parents also often scare the children saying if you not good you will go in the ambulance. the child is also having an injury and therefore wants to protect herself from any further harm. I don't think there was any abuse in this case.
11	37	No fear of teacher, injury in line with history
12	39	Child seals comfort on the teachers lap, scared of paramedics which is normal, no other obvious injuries and story seems to corporate with injury pattern
13	44	Children are usually weary of strangers when injured or ill. Comfortable with teacher on her lap. The story coincides with the injury
14	55	The history of the playground activity. The comfortable nature the kid has with the teacher. The timeline and non-delay of EMS getting contacted.
15	56	Although the falling is a common thing with children, the child should not be so scared of adults as well as the bruise on the homers has nothing to do with the acute injury
16	58	I feel this child is nervous around people she does not know and it does not help that she is in pain. The history does not really indicate any foul play.
17	61	History of incident, child is comfortable with teacher, ems was activated, child appears to be scared by anyone coming near
18	65	Arm
19	66	Child comfortable with adults that are known

20	75	Plausible story, mechanism and injury collate, child seeks comfort in teacher and is weary of strangers, single injury, no delay in seeking assistance
21	77	Having treated numerous paediatric patients with fractures or dislocations post being in the playground, I would not find this overly concerning with regards to abuse. This coupled with the fact that the patient does not complain of pain anywhere else on the body. Abuse would likely not have been localised to only the arm. Also, it stands to reason as to why the patient would be weary of EMS staff - we are strangers to her. However, due to the fact that she is easily consolable by the teacher, this would not lead me to suspect abuse, as if the teacher had in fact abused the child, the child would not want to be near the teacher.
22	80	INJURY CONFORMED TO MECHANISM OF INJURY
23	81	Child comfortable with teacher. No other injuries. Seems like an accident
24	83	Yes because of the child's initial condition, obvious deformity she is in pain, children can develop PTSD very quickly if pain isn't managed. As for abuse, EMS are strangers, not all children take to people they don't know, having said that she could have been exposed to EMS before and has a bad association with them.
25	88	It's not abnormal for a child to consult with an adult they know and to fear EMS staff
26	93	Children do break bones however a child should not be unhappy around a known care giver. My own limited experience would suggest that a child experiencing pain and surrounded by strangers would be more prone to want to remain with a known care giver. The opposite is a red flag.
27	97	Child is scared of EMS, yet, no other injuries
28	101	the fact that the child cries if anyone come close to her besides the teacher and EMS staff. it's clear that the child has some sort of fear expect for the teacher and EMS staff, she basically feels safe with them
29	108	She fell from a jungle gym. She had her trust in the teachers. She doesn't know you as personally as they do with the teachers and feels safer with them. Bruising with arm due to injury will be there. But can recommend a safety check for equipment to determine if it is to standards for age of children playing there and supervising staff.
30	109	trusting the teacher only
31	112	The bruise on the arm
32	113	Child is comfortable Hx and injury correlate
33	114	At the age of 3 children are prone to falls, and is weary of EMS staff because they are not familiar to her
34	116	patient fell at school, teacher called EMS and patient is comfortable around the teacher
35	117	The mechanism of injury
36	123	If the kid had been hurt by teacher. She would not go to her. Also teacher did not wait calling for EMS. also, there were other kids that would have said something.
37	126	As per the last case presentation, the story is highly plausible, there are numerous witnesses that could be asked to corroborate the facts, the child appears to be acting as a child would normally in the presence of someone she trusts and has the normal weariness of strangers in her specific position.
38	130	The protocol no by the kid with the regards to the body would have to be repo reported
39	131	As a medic it is difficult to accuse someone without all evidence unless the child confirms that whoever hurt her
40	136	I think the fact that the child appears comfortable with the teacher, and weary of the EMS staff is good. Although, children don't normally get up and run with a deformed arm.

41	135	patient has appropriate response to EMS or strangers. No other injuries noted. Patient is finding comfort in a known adult who she clearly trusts to protect her.
42	139	Suspicion - Expect a proximal humerus fracture as opposed to distal if the arms were outstretched. Unsure of whether this is as a result of an underlying bone density/other issue. Unsure of height from which the fall occurred. Would expect that on being hurt, the child would remain where she fell and cried as opposed to run immediately to the teacher.
43	140	The child is on the teachers lap, very wary of other people
44	141	Patient prefers to be sat on her teachers lap during examination which suggests that the child trusts her teacher. Patient s injuries in consistent with how the injury occurred. emergency services were called promptly.
45	145	A child with an obviously deformed arm would not necessarily get up and run?
46	149	Consolable by teacher only.
47	152	The patient is comfortable with the teacher and does not show fear of the teacher. She only displays fear towards the people she does not know.
48	153	Teacher witnessed the fall
49	157	Patient appears comfortable on teachers lap but weary of EMS staff
50	161	Children can break their arms on n jungle gym. The child is comfortable with the teacher. Reaction of child normal to people she doesn't know.
51	162	The teacher contacted EMS immediately, the teacher was busy watching the children play. The incident appears to be an accident and an accident that happens often on jungle gyms. The child is also not afraid of the teacher and seeks comfort from her. Children are naturally weary of EMS staff as they are strangers
52	163	The child could have been pushed off the jungle gym or she fell.
53	164	The child is comfortable with the teacher and only the arm is painful. No other bruising is noted. Children tend to fall off jungle gyms and it might have been an accident.
54	165	Appears comfortable with teacher. Isolated injury
55	169	Although children are resilient a fractured humerus is, I believe, possible with a fall from a height. the Child is anxious around EMS, but this is probably an adaptive approach. I'm pretty anxious around EMS
56	171	The story has credibility - She ran towards the teacher when injured and is comfortable on the teacher's lap. 3 year olds are generally wary of persons they do not know so I accept this as normal behaviour - No other injuries noted.
57	177	3year olds can be very scared of strangers. So the fact that she is wary of the EMS doesn't necessarily mean anything. At that age you either have a child that is wary of any strangers or you have a child that will go to any stranger. Maybe the kids have never had a talk done by any ems company or any people in uniform and the child doesn't associate the ems personal or anyone in uniform as people who help others. She obviously feels comfortable with her teacher as she is around her daily
58	178	The child had injuries consistent with mechanism. Child is comfortable with teacher which shows trust
59	179	The patient obviously is trusting of the teacher and the injury is concurrent with the story.
60	180	Unsure of the height of the equipment, but if deemed safe for kids to play, then no.
61	182	Child weary of strangers but consoled by teachers, no physical hx of child abuse.? Accidental fall plausible
62	188	The teacher saw the incident happened. She is comfortable with the teacher.

63	189	Story seems viable. No fear of teacher. Wary of EMS is normal guarding-type tactic? Quick call for help, open & transparent. Multiple witnesses with no report of conflicting version of events
64	202	-the child is comfortable on her teachers lap -the child reports no pain anywhere else
65	207	Child is comfortable/feels safe with teacher. ran straight to her post injury and seeks additional comfort from her on assessment from EMS "strangers".
66	212	The child has a good relationship with the teacher. Reaction is normal to unknown people.
67	213	School watch by the teacher, rapid prompt of EMS.
68	217	Everything sounds realistic the only doubt is when the patient cries every time anyone comes near her. Fearing contact or specialisation is not normal. But then again she is in pain and experienced trauma.
69	218	She appears comfortable on her teachers lap and is very weary of EMS staff.
70	220	She appears comfortable on her teachers lap and is very weary of EMS staff
71	222	Child is comfortable with the teacher holding the child on her lap

Table 7.8: Case three comments

N	ID	Which facts of the case above assist you in the decision you made above- Please comment to justify your answer
1	20	The history of apnoea's does not match the injury to the eye. I would suspect this is a case of where the parents shake the child.
2	21	3-month-old children are not very mobile and injury to orbit is not in normal standing with accidental fall 3am child should not be actively able to become injured
3	22	The injury to the left orbit with the retinal bleeding. Suspicious injuries.
4	26	Hx inconsistent with presentation and delay in seeking medical assistance
5	28	Presents with symptoms of shaken baby syndrome
6	29	No medical assistance, despite 2-week event No medical attention post seizure at 03:00 No history of trauma as per parents, however showing signs and symptoms of head injury.
7	31	Somethings not adding up the apnoeic episodes should not cause swelling within an orbit.
8	33	Long history of apnoeic episodes, this however seems to be the first time they have seen a doctor for the problem. They are at a doctor's room, not an emergency department. If the episode happened at 3 in the morning and was worse than normal why didn't they seek medical attention immediately. They however chose to wait until the doctor's rooms opened even though the infant was behaving abnormally. No history of trauma, but there's definitive signs of raised ICP and evidence of retinal bleeding in the left eye
9	34	The patient presents with clinical signs of "shaken-baby syndrome". The patient would have to be examined further as well as parent interviews conducted however the obvious signs of abusive head trauma should warrant a child abuse investigation.
10	36	the patient has had apnoeic spells for the last 2 weeks and the mother is only bringing the child in now. there is no history of trauma, but the baby has retinal bleeding as well as swelling within the left orbit.
11	37	Swelling of the orbit suggests had trauma and not really in line with pane only
12	39	The bruise on the left eye/orbit does not corollate with the said presentation or history given, apnoeic spells wouldn't or shouldn't cause any form of injury, the child seems to be presenting with a head injury and not the given history by the mother
13	44	No clear explanation regarding the orbital injury. Could indicate shaken baby syndrome. Seizures could indicate raised icp
14	55	The lack of information by parents. The nature of injury not linking to hx of feeding. Obvious trauma to head and eye/orbit, indicative of a non-natural injury process.
15	56	The patient appears to have a head injury and a 3-month-old should not present with this. The feeding problem has been ongoing for 2 weeks and should have been assessed earlier
16	58	The fact that there has been a 2-week history of apnoeic spells is a little concerning, why have the parents only just reported it to their paediatrician? I would also like to know how the swelling in the left orbit occurred.
17	61	injury does not seem to be compatible with nature of incident

18	65	His
19	66	Story does not match clinical presentation
20	75	2 weeks of apnoeic episodes and only seeking help now? 3am seizure and apnoea and only seeking help later? Retinal bleed collates with baby possibly being shaken,
21	77	All of these signs speak of head trauma and raised intracranial pressure. Namely, the bruised orbit, the seizing, the irregular respiratory rate and increased heart rate for age. Also, lethargy. I suspect this is a good case for child abuse, as unless the baby fell off something high or hit his/her head Hard, this trauma would have to be caused by intentional harm.
22	80	SEVERE TRAUMA TO THE EYE WITHOUT BEING INVOLVED IN An MVA
23	81	Pt been ill a long time and mom only bring him to hospital now. Signs of neglect and abuse
24	83	3-month-old babies don't roll around yet, I'd suspect the baby was hit in the face
25	88	Obvious signs of head trauma, signs and symptoms of head injury. Parents reported no trauma episode but, yet pt. is showing signs of trauma.
26	93	An unexplained head injury with what appear to be neuro signs in an infant is a huge red flag. The parents offer no explanation. I feel that this warrants investigation.
27	97	Swelling behind the eye, waited long before seeking medical help. Irregular vitals
28	101	un explained swelling
29	108	Swelling of left orbit. Also, child being lethargic doesn't come just within feeding time. And due to injury why didn't the parents firstly taken the child to the ER?
30	109	mistreating the baby and delaying treating
31	112	Bleeding in the eye and that the child has been having apnoeic spells for 2 weeks
32	113	According parent no trauma involved examination reveal trauma
33	114	Mother said there is no history of trauma but why does the child has swelling of the left orbit? And child not responding as should for age as well as the lethargy, says to me they child is not getting the attention he requires.
34	116	very sleepy, retinal bleed and cyanosis
35	117	History and previous cases.
36	123	If there is no history of trauma. He should not have trauma to the orbit. Also torn retina does not tired up with the history. Even with seizures those injuries are not consistent
37	126	Certainly, abnormalities with feeding are not uncommon. However, if this is a first child to new parents, unable to cope properly with a "fussy" infant and frustrated by his perceived poor compliance they may respond unfavourably with losing their temper etc. This may well result in physical abuse of the infant secondary to their own strained mental state. This would need to be evaluated through a very detailed history. The child's physical injury, and general poor condition at the time of presentation could well be evidence of blunt force trauma to the head, the specifics of which would need to be carefully examined through a very detailed history of each parent on their own, with a high index of suspicion. Obviously detailed physical examination, with radiology etc as required can help with diagnostics and determination of mechanism of injury. I would think that any gaps in the history would be highly suggestive of some form of abuse, as a 3-month-old is not able to physically place themselves in a position to sustain such an injury (due to limited mobility).
38	130	Prolonged pain guarding looking at the mechanism
39	131	The parents confirm that the child is not well for the past two weeks and only acted now.
40	136	The swelling of the left orbit and retinal bleed is inconsistent with the apnoeic spells.

		The baby does not present as expected for a child his age. If the apnoea and seizure happened at 3am, why did they wait till the day time to take the child to the doctor? He should have been taken to the emergency room directly!
41	135	Lethargic and apnoea spells may be normal pathologically for this child, but the history would indicate that the parents should have approached health services sooner. Retinal bleed may be due to hypoxic seizures activity and trauma, but history is non-descriptive. Further investigation is required.
42	139	2-week history of apnoeic attacks before going to a paediatrician for examination. parents did not indicate any trauma or other adverse events to account for the swelling within the left orbit and retinal bleeding.
43	140	Bruising of the eye, and the child has been unwell for a while and the parents have not done anything until now. They are not caring for the child correctly
44	141	A three-month-old child cannot injure themselves to the point these above injuries unless it was inflicted by an adult. The injuries have occurred about 2 weeks ago meaning parents were hoping the injury would heal without a consulting. Patient has deteriorated during that period and now only explain of what happened that day. I would bring it up to the authorities
45	145	uncertainty as there are some potential tell-tale signs of a possible head injury?
46	149	Signs of traumatic brain injury. History does not make sense, i.e. cause of tube.
47	152	The history given does not correspond with the oedema and retinal bleeding.
48	153	Patient has hx of apnoeic spells, no hx regarding a fall or anything that would explain the retinal bleeding
49	157	Presentation inconsistent with history from parents
50	161	Apnoeic spells for two weeks without consultation. Parents story inconsistent with injuries. Patient has a decreased gcs, seizures, swelling in the left orbit, evidence of retinal bleeding in the left eye increased irregular breathing and increased heart rate. Patient displays definite signs of trauma even though parents deny any history of it.
51	162	The parents have prolonged seeking assistance for the apnoeic spells. The infant is also presenting with swelling to the left orbit that does not fit with the parent's story as it does not occur due to apnoeic spells.
52	163	Family taking a long time to take the pt. to get checked out. There's swelling and bleeding
53	164	The parents should have taken the baby to the DR 2 weeks ago when the incident first happened as it has now caused further damage to the baby. What might have caused the swelling on the left orbit?
54	165	Evidence of trauma without matching history being supplied
55	169	A lethargic baby with irregular respiration is an emergency. The eye is very concerning whether the injury is from blunt trauma or the 'seizure'. The mother's account is questionable
56	171	The signs and symptoms indicate that the infant has 'shaken baby syndrome' - Seizures can be related to raised intracranial pressure. The retinal bleed and lethargy also indicate shaken baby syndrome, irregular respiratory rate is indicative of head injury and raised ICP
57	177	As far as I am concerned a 3month old wouldn't just suddenly present with retinal bleeding with no other history and if the child has had apnoeic spells whilst feeding for the past 2 weeks surely the parents should have been concerned and taken the baby to a paediatrician within 24hrs of the very 1st episode. As a mother even though I am an AEA

		if that were to have been my child, I would've taken my child straight to see a GP/paediatrician/the ed immediately. The fact the child isn't on par for its age is also concerning
58	178	The patient should have received care much earlier. Evidence of a possible head injury with no report of trauma
59	179	Evidence of a head injury as well as injury to the swollen eye as well as possible shaken baby syndrome signs and symptoms. All of which are concurrent with trauma, since the parents deny a history of any trauma the case is certainly suspicious and should be investigated.
60	180	The clinical presentation doesn't correspond with the history given.
61	182	No hx of trauma reported by parents, physical examination? Trauma. Hx does not match pt. signs and symptoms
62	188	The swelling is a concern. It is the responsibility of the doctor to report the case. As an AEA it is not for me to question the medical practitioner, BUT I will follow up both at hospital and with the practitioner.
63	189	Clinical presentation disastrous. Parents delayed treatment- 2-week Hx and now at least 4/5hrs since last episode to Doctor visit.
64	202	-the child is lethargic -the child is not responding appropriately for his age -there is evidence of retinal bleeding
65	207	Lack of development for age as well as irregular findings. Delayed doctor assessment for apnoeic spells. Child is lethargic and irritable and has some eye (possible head) trauma.
66	212	Parents history inconsistent with the injuries. Patient was left for two weeks before any consultation. Patient presentation indicates trauma. Swelling in the left eye, decreased level of consciousness and retinal bleeding. Convulsions may also be due to TBI.
67	213	This it is a clear medical condition case, probably a TOF condition
68	217	Sounds like shaking baby syndrome
69	218	The history from the parents don't match the injuries found by the paediatrician.
70	220	The doctor reports that there is evidence of retinal bleeding in the left eye. The infant has an increased, irregular respiratory rate and increased heart rate for his a
71	222	Presentation of eye and the bleeding

Table 7.9: Case four comments

	Response ID	Which facts of the case above assist you in the decision you made above- Please comment to justify your answer.
1	20	Not only is this a case of neglect but it is very likely that this child is being abuse. The injuries do not match the child's history and the carer does not seem to be concerned about the patient's condition. The child also does not seek the comfort of the carer.
2	21	Injuries are significant No parent or guardian on scene Consider who called for EMS personnel
3	22	No one there to meet you outside (usually concerned parents will meet you outside and try to rush you). Young adult male, potentially to immature to look after a child. Suspicious history. The bruises found on the patient. Sustaining a femur fracture takes excessive force. A cot isn't that high that a child should fall out of it and sustain a fracture. The blood on the lips is suspicious.
4	26	Hx inconsistent with presentation and delay in seeking medical assistance evident. The various colours of the bruises indicate injuries were sustained at different times.
5	28	Child appears neglected with old and new bruising
6	29	No concerned person to meet you Malnourished 2 year old content to go to strangers Femur fracture- odd as I would think in climbing out the cot more likely to hit head/bum due to landing. Cried blood around mouth- no active bleed but no one bothered to clean the child. Multiple stages of bruising in an area usually covered by clothing- therefore not visible to everyone
7	31	The whole case is suspicious and indicative of suspected abuse
8	33	No one comes to meet the ambulance or to direct them to where they need to be. This shows a lack of concern and no sense of urgency on behalf of the caller. Pre disposing factors (economic circumstances) that make the risk of child abuse higher. Child found in her cot that she allegedly fell out of recently crying, there's no attempt by the caretaker to console her, it shows a lack of sympathy and care for the child. Child immediately reaches out to the EMS crew, she has probably been treated for a previous injury and associates the paramedics uniform with love and care. Why is the cot still standing in the middle of the room if the child just fell out of it, surely normally corrective measures would be put in place to ensure that it doesn't happen again. Injuries inconsistent with history given , it takes a lot of force to break a femur. Old bruises that already show signs of healing on the child's chest which is not a common self-inflicted injury place for a child her age. The lack of clothing shows lack of care.
9	34	The patient's clinical injuries are not correspondent with a single fall out of a cot. Given the socio-economic conditions as well as no adult supervision this case is indicative of abuse as well as neglect and should be reported immediately to the authorities.
10	36	the fact that the parents or caretaker were not worried on arrival is a concern, the child conditions are also questionable. the child is in just a nappy , no one is trying to help the child either. there is dried blood which means there is either a previous

		injury or they took long to phone the ambulance. injuries are also huge for a small fall from the cot. injuries are also on the back and front which is unusual with a fall. normally only the place of impact.
11	37	Squalid environment, not meeting ems suggests little concerns, old bruising suggests past injuries, not ready for child to get out of cot. Child wanting to go to ems (when normally they are scared of strangers).
12	39	The bruising shows old injuries, the want for you to hold her as you enter proves she is scared and wants you to rescue and help her, letting you pick her up with a fracture femur says a lot because it's probably the most painful bone to break, the dry blood on her lip doesn't make sense, should be napping bout found on the floor crying, isn't holding the crying child as the care giver, story doesn't make sense, the whole setup is strange and dodgy, poor little thing wants love from a stranger says a lot
13	44	Child is thin and may indicate neglect. Force of fall is not sufficient to break a femur. Blue yellow and brown bruises indicate new and old bruises respectively
14	55	There is again a lack of hx information. The injuries do not relate to the information given. A femur fracture with blood around lips doesn't link to possible falling out cot. Also, the social condition, thin child, not coming out (not real concern for child's health)
15	56	The child appears to be neglected as the blood is dry, the bruises are in various stages of healing, the child is longing to be picked up and cared for, the child is thin and hasn't been fed. No one was around for to watch that the child doesn't fall out the cot
16	58	The fact that the child is in such a poor condition and the multiple injuries over the body, including what may appear to be older bruises (due to the colour). The conditions in the flat are also not conducive for raising a child. It really does sound like a case of abuse and neglect.
17	61	living conditions are poor, pt. on the floor, not being cared for properly, old injuries present, significant impact in order to break paed's bones specifically femur
18	65	Oh everything
19	66	Evidence of multiple injuries of various stages of healing
20	75	Evidence of abandonment, story and injury timeliness and pattern don't fit, evidence of multiple injuries over a period of time, child seeks comfort in a stranger,
21	77	1. Query fractured femur. 2. Bruises on chest and sternal area. 3. Squalid living arrangements. 4. Crepitus on palpation. 5. Baby reaches out to an unknown figure on approach instead of the known care taker. 6. Dried blood indicates some type of penetrating trauma had to occur. In most cases, if a baby falls out of a cot, this would likely not lead to such trauma where fractures is included. Considering the squalid conditions, I would imagine the patient would have fallen onto a concrete floor, and in so doing would likely have hit their head on the floor, thus indicating a head injury, which has not been mentioned, neither does the baby present symptomatically so. In my opinion, clear case of abuse.
22	80	NEGLECT AND CHILD ABUSE
23	81	Signs of abuse and neglect. It takes a great deal of force to break a femur. Evidence of previous injuries

24	83	Very concerning !! I'd phone for the police, the child is happy to go to a stranger, another red flag, old bruises
25	88	Regarding the time of fall, bruises might be and indication. Position of bruises might be indication of assault. Pt also find comfort in a stranger which should arouse suspicion
26	93	Poor living conditions. Multiple signs of trauma. Absent or uninterested caregivers.
27	97	Living conditions , usage environment, unsupervised child, bruises of different ages, appearance of child
28	101	there are sufficient signs of abuse
29	108	Absolutely abuse. Presenting with history noticed will indicate red alarm and child to be taken with you as child doesn't feel, safe with caretaker. Circumstances with bruising, dry blood, etc. should indicate also to involve Child protection services
30	109	injuries found, and condition found on the patient the living environment
31	112	Child was left alone in the flat and also doubt that a fall out of the cot could have cause a possible femur fracture
32	113	Old trauma involved as well as new no proper hx to old marks on child
33	114	Old bruises? Conditions of the flat? Child might have fallen out of the cot can't confirm nor deny that. Might be more than just physical abuse going on, emotional as well
34	116	caller not approaching, patient been thin, bruises noted, femur crepitus and flat conditions
35	117	The scene and history and mechanism of injury
36	123	The care taker does not even know what happened. Bruises also inconsistent with history. Also sounds there are signs of neglect. Kid also is willing to come to stranger's wand wanting to be loved
37	126	The child is left unattended during the day, is not appropriately dressed, appears underfed for her age, and is left in the care of another youngster for protracted periods of time. The general living conditions appear squalid, and this along with the inner-city environment are usually indicative of low-economic-status households where statistically the incidence of neglect and abuse is higher. There is definitely a strong case for neglect here, secondly, the child has an "acute" injury of significance, and numerous evidences of historical injuries, which are generally unexplainable. She is also far too willing to seek physical comfort from a complete stranger which does raise some flags. I would be very suspicious in this case, that either she is getting physical abuse from an adult(s) or possibly even from the older juvenile that is her apparent care-giver.
38	130	Fallen from height blood out nose possible c spine injury and why was no one watching the child
39	131	The child presents with multiple injuries or skin bruising which appears to be older than the current femur injury.
40	136	thin child. unattended with no lack of concern from the caretaker. the child also will go to anyone, even if it does not know them. Why does the child have dried blood on the lips? Why is it dry?. Also, yellow and brown bruising on the body is inconsistent with the description of the injury, and they show varying degrees of healing, which is indicative of regular abuse.
41	135	Long standing trauma and bruising indicates repeated physical damage. No stranger danger expresses lack of proper bonding with parents.

42	139	Child is thin. The bruising on the posterior and sternal area may be indicative of the child being "held" roughly. Bruising of blue yellow and brown indicative of "old" injury. the child does however hold out arms to be picked up, so she does not appear to be scared? Slightly out of sync with clinical presentation.
43	140	The child holds her arms out to you. Children are generally wary of strangers and should be uncomfortable with you other medical findings of bruises etc
44	141	A two-year-old cannot fracture a femur bone on their own even if they fell. It's unlikely that a child can fall and injured their chest and back unless an adult assaulted them. Secondly patient is thin is it due to malnutrition and why is there no parents of the child to come and receive me. Patient is abandoned.
45	145	The case presented depicts several concerning issues indicative to abuse.
46	149	Signs of previous abuse, consolable by a stranger and not caretaker.
47	152	There are signs of previous injuries on the child and the history that the child my fell out of the cot does not indicate enough force that a femur might be fractured.
48	153	The colour of the bruises indicate that they are a few days old
49	157	Yellow and brown bruises noted - old bruises
50	161	Injury inconsistent with history. Care taker is young. Living condition neglected. Easily went to unknown people. Fractured femur. Dried blood on the lips. Signs of previous injuries healing.
51	162	The child has not been dressed appropriately, The child minder does not appear to be too concerned with the EMS staff and the child that has been injured. The child is afraid of the child minder and seeks comfort from the EMS staff immediately. The child also presents with old bruising. The fall from a cot for a child should not fracture a femur.
52	163	Femur fracture. Multiple bruises. Dry blood
53	164	The bruising is not only new as there is brown and yellow bruising. The child should have been taken to the hospital once she fell out of the cot and was crying due to the pain on her leg. Is the dried blood on the lip due to the fall? Where was the adult male when this happened?
54	165	Evidence of injuries of varying ages. Femur fracture requires significant force, and unlikely in this environment. Seemingly unconcerned caregiver
55	169	The child has several injuries apparently at different stages of healing suggesting abuse. The child is emaciated, and the fractured neck of femur could not have happened falling from a cot.
56	171	Child is thin Desperate for love - reaches out immediately Takes incredible force to fracture a femur Healing bruises indicated previous assaults
57	177	1stly is the young male the care taker for the building or the child. 2ndly a fall from a cot could not have caused a # femur if anything the child would've landed on its arms or head. With a child being out of proportion if it were to just have started to learn to walk you would find bruises on the child's head and legs not posterior chest and sternal area. It's not normal for a child of that age to just reach out to a total stranger. Dry blood present on the child's lip is also concerning

58	178	Evidence of neglect and old trauma or something the torso not a normal injury pattern for a child of this age. No clothing on the child. Squalid conditions.
59	179	All of the signs and symptoms are concurrent with abuse and none are concurrent with falling out of a cot. Bruises of the different colourations also indicate long standing/ongoing abuse.
60	180	The clinical presentation as well as the many bruises in different stages of healing indicate abuse in my opinion.
61	182	Various stages of bruising noted, child? Malnourished? Squalid conditions. Single adult male caretaker? Crying uncontrollably
62	188	The child left alone at home! The bruises should be investigated, and a detailed history is important.
63	189	Unusual that child would greet Child left to cry Condition of flat Child looking for protection Femur # = force Bruising at different stages Dry blood around mouth
64	202	-the child holds her arms out for you to pick her up - the child is thin -there is evidence of old bruising on the chest
65	207	Living conditions. No active adult monitoring of child and/or concerned adult present. Malnourished/thin. Presentation of old trauma/injuries across body.
66	212	The care taker is young. The injuries are not consistent with history. Foul living conditions. Healing bruises. She is very thin.
67	213	Clinical findings suggest physical abuse to the Child.
68	217	Where are the parents? To break a femur of a 2-year-old needs quite a large impact or energy transfer. Posterior chest bruises and sermon makes me uneasy. How does the patient obtain on both sides after a fall?
69	218	The patient displays signs of not wanting to go to a "family" member. The fact that no one came out to get the crews, displaying signs of lack of interest, the fact that the infant was found on the floor next to the cot, crying and no "family" member came to assist or console the child. The type of injuries could suggest assault. The conditions of the flat could be a sign of general neglect, but more detailed observations should be done.
70	220	On arrival, there is no one who comes to meet you, eventually you find the flat number and a young adult male greets you and shows you to the child's bedroom.
71	222	The old bruises

Table 7.10: Case five comments

	Response ID	Which facts of the case above assist you in the decisions you made above- Please comment to justify your answer.
1	20	This seems like a classic case of SIDS; however, I think the child is a bit old for SIDS. There is no signs of abuse and I do not think the child was neglected so I do not think you need to report this as abuse.
2	21	Any infant death is considered to be of significant investigation Infants do not commonly just die
3	22	Unnatural death. Rigor mortis does not set in within an hour, which means the day mother is not telling the truth about events.
4	26	Any unexplained fatality should be referred to the forensic pathology services for investigation as per the Forensic Pathology regulations pertaining to the National Health Act
5	28	Suspected SIDS case would need further investigation
6	29	18 months usually out of normal SIDS related deaths No one- in a day care environment- checked on child Signs of rigor mortis set in despite <1hour since feed and warm environment
7	31	Any infant death should be a defaulted concern for abuse. This case could have been a simple cot death but also maybe the care taker should have check earlier or something may have happened!
8	33	Time line given in the history is inconsistent with the physical findings. According to the history provided the child went to sleep at 14:00 however when the EMS crew arrives there's evidence of rigor mortis, which doesn't set in so quickly. The child is overweight, inappropriate nutrition for a prolonged period of time. Why is the child only in a nappy but the caretaker thought that it was appropriate To wrap the child in a blanket in a warm room. An 18 month old child generally doesn't still need to be wedged while they are sleeping so why was it supposedly done for this child. Why didn't they check on the child sooner
9	34	The circumstances of the death as well as signs of rigor mortis do not correspond to the history received. The fact that the day care centre appears not to be a regulated facility and history of poor child monitoring is a concern also. This case appears to be unnatural and therefore should be referred to the authorities for investigation and post mortem assessment.
10	36	first of all, it's an informal day care centre. they are looking after people's children and should take the proper procedures to do so. they also should be checking on the children and making sure they alright and not wait for the mother to get there. Rigours is not a quick thing which means that baby passed away a few hrs ago.
11	37	Overweight infant suggests over feeding, but if kept lateral it would have been sufficient. It's not natural for an 18 month old child to die
12	39	This is also a strange setup and setting, the rigor Mortis makes for a very strange story as it normally sets in around 40minutes to 4-6 hours after death, doesn't corollate with the story and needs to be reported and investigated. Also, an overweight not finishing feed doesn't make sense when he seems to enjoy his food
13	44	Room is warm, and the child swaddled. Rigor would not set in in such a short time frame. The story does not correlate with findings on the deceased
14	55	The fact that this child might have choked during feeding. The lack of appropriate response and negligent actions by care giver.

15	56	It is not the normal life cycle for a child to die and therefore an autopsy must be performed. Why is the infant overweight and for rigor mortis to be set in there must have been a long period of neglect
16	58	The fact that the baby is already in rigor mortis indicates that the day mother is not providing adequate attention to the children in her care. I feel she should be checking on the children more frequently. Also, she reports that the child was only put down one hour ago. This is not long enough for rigor mortis to set in.
17	61	overweight child, death of a child, rigor mortis - time frame of incident!!
18	65	His
19	66	Death not under medical care not necessarily negligent but cause of death is unknown and needs investigation
20	75	An 18-month-old should not be wrapped in a blanket or require a foam wedge for support. Rigor Mortis does not fit within the 1-hour timeline reported, day care centres must be registered and comply with regulations.
21	77	Rigor Mortis takes hours, to set in. This would indicate that the baby has been dead much longer than has been mentioned, possibly indicating some type of neglect.
22	80	RIGOR MORTIS. NEGLECT DUE TO TIME SPAN NOT BEING ATTENDED TO
23	81	Baby not feeding well. Conditions of the day care. Maybe the carer not educated enough to look after children
24	83	Concerning yes, the baby is dead. No bruising or physical signs, however the day mother is questionable because she didn't once check on the baby .. irresponsible... babies technically don't just die I'd hand it over to the police
25	88	By assessing the scenario negligence is at play as baby was unsupervised for a long period of time. In proper feeding might occurred. Should be established whether day care centre was meeting requirements to look after children
26	93	Narrative describes neglectful surroundings for victim and other children. This is an unnatural death. Requires police attendance.
27	97	Unnatural death
28	101	the baby is obsessed the baby was feeding suspect SIDS
29	108	This is a case where this couldn't be natural death and can valid a post mortem.
30	109	neglecting the patient
31	112	I think the presentation of the baby and the time frame 14H00 to 15H00 could be wrong
32	113	Normal circumstances. Why wrap in blankets in hot room. Suggest for post mortem to get cause of death
33	114	Rigour mortis in an hour? Highly unlikely 3hours min... which means day care mother did not look after the child for 3 hours even if he was sleeping
34	116	for a care mother that's wick, she expected to frequently check on babies. for a child to reach rigor mortis that means it been a while pt. p4 and she decided to withhold the info...so the question is why?
35	117	The mechanism of injury and history with injuries
36	123	Pt is in Riga mortis. Pt has been dead probably more than an hr. Pt was put down straight after eating and not in the correct position and overheated. Baby could have aspirated
37	126	Whilst it is possible that a toddler could die at any point from unknown disease or illness, specific to this case, I would be concerned at the apparent elapsed time since

		death to activation of EMS. This is suggestive of neglect in so far as that the youngsters are not being carefully monitored. The fact that this happened at a care centre is concerning. There is a definite case for reporting to authorities here, and a post mortem should be done to determine the cause of death - whether the result of physical insult (perhaps aspiration of foodstuff due to improper feeding technique) or infectious aetiology (meningococcal disease that could affect other children in the same facility)
38	130	There was no one keeping an eye on the child rigour-mortis can take up to 12 hours to set
39	131	Clearly the care giver did not take care of the baby as the baby was left alone for some hours, the child might have aspirated accidentally but still could have been prevented if the care giver did what she was supposed to do
40	136	Rigour Mortis does not present after only 1 hour in the shoulders and knee joints. the baby is 18 months old, and does not require a wedge to sleep, as they can roll over and stand etc.
41	135	Multiple risk factors identified as increasing risk of SIDS. A proper secondary survey may lead to more clues. Informal day-care needs to be reported.
42	139	Child went to sleep at 14h00 and scene time was 15h00. Rigor mortis set in (although onset depends on temperature), possibility that the child had died earlier. Child was wrapped in a blanket with only a nappy in a warm room with no history of illness-Kept lateral by wedge therefore remote likelihood of aspiration.
43	140	Not entirely sure with this one
44	141	Infants need to be constantly monitored which means the child has been neglected in the case.
45	145	Neglect Informal day care centre Poor feeding technique
46	149	No obvious cause of arrest.
47	152	The only sign of abuse I do see is that the care taker did not care to make sure the child was sleeping and doing well.
48	153	Sounds like SIDS, so I would report it, as I cannot diagnose it
49	157	No obvious trauma. Over weight.
50	161	Inconsistency in story with regards to the time line. Rigour mortis only sets in from 4 hours after death the infant couldn't have had a feed just before going to sleep. Day mother allegedly did not check on the infant which is also concerning.
51	162	I do not suspect the day mother has abused the infant, however the infant has died under suspicious circumstances. Police should be called for investigation as it is an infant. It is possibly a case of SIDS. However, the fact that the day mother did not check on the infant is concerning.
52	163	Any child should not die so suddenly. That is a big concern. Overweight child that didn't finish eating food is also a concern.
53	164	SIDS is possible from birth to 1 year of age. The baby is 18 months old. It is an unnatural death and should be reported with further investigation done.
54	165	Unexpected death of a small child must be referred.
55	169	One hour is too short a time for rigour mortis to take effect so the story is incorrect. The blanket on a hot day is strange and the foam wedge is unusual as babies don't need to be on their sides to sleep

56	171	The patient was in a warm room in a blanket - The rigor mortis would not have set in as quickly as is indicated by the day mother. The time line is not logical.
57	177	The fact it's an informal day care already sets off alarm bells, because they have NOT been inspected by the health department and why was the child not checked on regularly especially having just been fed? The child is probably left in the cot all day and doesn't get exercise because a 18month old should not be overweight if adequately active
58	178	It could be accidental death or neglect or SIDS. This case requires further investigation
59	179	The fact that the patient has been either neglected for long enough being dead and now in rigor mortis which takes quite some time is concerning and it also seems that the patient could've been placed there. Also, the timeline of the caregivers story does not match the patient being in rigor mortis.
60	180	The clinical presentation compared to the history given does not correlate. I would refer the case to authorities for further investigation and SIDS cannot be diagnosed pre-hospitally.
61	182	Unknown cause of death, unremarkable physical exam. 1 hr since last seen alive, warm room and pt. in rigor mortis
62	188	The rigor mortis is a concern - the history given does not fit the scene. The baby died earlier than suggested - no checking on the child on a regular basis can be suspected.
63	189	Even if unintentional, this seems a case of neglect.
64	202	-it's an informal care centre -the child is wrapped in a blanket with only a nappy on - the child is in rigor mortis
65	207	For rigor mortis to be present, child must have been left unattended/unmonitored for an extended period of time. Informal day care centre presents the argument of inadequate training of staff and no regulations regarding running of centre.
66	212	Inconsistent time line. Story does not add up. Rigour mortis only sets in 4-6 hours after death. Infant over weight.
67	213	Abuse doesn't form part of the picture, but SIDS is a possibility that will need Post mortem autopsy
68	217	No decision made
69	218	The time frame of onset for Rigor Mortis is 2 hours post mortem, considering the ambient heat and the fact that the child was wrapped in a blanket, makes it hard to make a definite assumption. I would still report this as child abuse, due to the fact, the conditions of the day care centre and that the carer stated that she did not check on the child until the mother arrived.
70	220	There is no obvious evidence of trauma. Not required to report
71	222	Doesn't seem the story has a correct time line