Perceptions and experiences of registered professional nurses in the recognition of unexpected clinical deterioration in children in wards

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DECLARATION

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ABSTRACT

Unnoticed deterioration in the clinical condition of children in ward areas can lead to near or actual cardiopulmonary arrest. Children suffering from a cardiac arrest in hospital often display abnormal physiological parameters hours prior to this event occurring (i.e., within a 24 hour period). Prevention of cardiopulmonary arrest in the wards lies in the ability of nursing and medical staff to be able to identify these abnormal physiological parameters, i.e., early signs of deterioration, and to intervene prior to this event.

This study aimed to identify nurses' experiences with regards to current knowledge, clinical practice and training in the recognition of clinical deterioration in children. It could then be determined whether a formal guideline on the early recognition of clinical deterioration in children would be perceived as being beneficial by the respondents in this study.

The research question that guided this study was "what are the perceptions and experiences of registered professional nurses working in paediatric wards with regards to their recognition of unexpected clinical deterioration in children?"

An exploratory descriptive study, utilising a qualitative approach was applied. The target population consisted of all registered professional nurses working in paediatric wards in academic hospitals in the Western Cape, South Africa. Ethical approval was obtained. Informed written consent was obtained from the participants.

The purposive sampling method was used to select the participants (n=17) who met the criteria. Five focus group interviews were conducted to collect the data, using an interview guide. The planned methodology with its instrumentation and procedures was verified through a pilot study that was conducted on the first focus group interview. The steps of the research process included transcribing the collected data verbatim from the audio recordings and the field notes, and then analysing the data by summarising and packaging the data, identifying themes and trends in the data and verifying and drawing conclusions.

The analysis themes identified were based on Donabedian's conceptual framework, comprising Structure (the environment in which the care takes place), Process (method by which the care takes place), and Quality Assurance (the planned, organised evaluation of the patient care which has been rendered).

The findings showed that the increased level of severity of illness of children nursed in paediatric wards, as well as staff shortages, gaps in training on resuscitation and clinical deterioration, limited ICU beds and staff, lack of adequate monitoring and emergency equipment in the wards, and inexperienced staff are all factors that were identified that increase the risk of staff not being able to detect clinical deterioration in children nursed in paediatric wards.

Teamwork among nursing staff and other medical professionals, as well as parental involvement in the care of the children, assisted staff in being able to detect clinical deterioration.

Most participants were unfamiliar with 'early warning systems' and reported that there are no paediatric 'early warning scores' (PEWS) in place. They believed such a system would be beneficial; however they had concerns regarding the time it would take to score a patient, the training involved, and the ease of use of such a tool and system.

Recommendations for addressing non-recognition of clinical deterioration by nurses in paediatric wards such as appropriate knowledge and skill updating, were put forward in the study.

OPSOMMING

'n Kliniese verswakking by kinders wie in pediatriese sale verpleeg word, wat nie betyds waargeneem word nie, kan dit lei tot 'n amperse of werklike kardio-pulmonale arres. Kardio-pulmonale arres in kinders word dikwels voorafgegaan deur 'n verandering in die fisiologiese parameters (so vroeg as 24-uur voor die arres). Die voorkoming van saalverwante kardio-pulmonale arres berus op die vermoeë van verpleeg- en mediese personeel om die abnormale fisiologiese tekens so vroeg as moontlik waar te neem en daadwerklik op te tree voordat die arres plaasvind.

Die doel van hierdie studie was om die ondervindige van verpleegkundiges te identifiseer met betrekking tot die bestaande protokolle, opleiding en hulpbronne wat beskikbaar is vir die waarneming van die kliniese agteruitgang in kinders. 'n Bepaling sal gevolglik gemaak kan word of die studie-respondente 'n amptelike riglyn rakende die vroegtydige waarneming van kliniese agteruitgang in kinders voordelig sou vind al dan nie.

Die rigtinggewende navorsingvraag vir die studie was "wat is die sieninge en ondervings van geregistreerde verpleegkundiges in pediatriese sale rakende die herkening van onverwagte kliniese agteruitgang in kinders?"

'n Verkennende, beskrywende navorsingsmetodologie, met 'n kwalitatiewe aanslag, is gebruik.   Die teikenpopulasie het bestaan uit alle geregistreerde professionale verpleegkundiges, werksaam in die pediatriese sale van die akademiese hospitale in die Wes Kaap, Suid-Afrika. Etiese toestemming, asook ingeligte, skriftelike toestemming is vooraf verkry van elke deelnemer.

'n Doelbewuste steekproefnemings metode is gebruik om die studie deelnemers, wat aan die navorsingskriteria voldoen het, te kies. Vyf fokusgroep onderhoude is gevoer om data in te samel en 'n onderhoudsgids is gebruik vir dié onderhoude. Om die navorsingmetodologie, instrumentasie and prosedures te bevestig, is 'n voortoets tydens die eerste fokusgroep onderhoud gedoen. Die stappe van die navorsingproses is gevolg om die ingesamelde data, bestaande uit klankopnames en veldnotas, woord-vir-woord oor te skryf. Die data is hierna ontleed deur middel van opsomming en samevoeging, terwyl temas en neigings geïdentifiseer is en afleidings geverifieër en gefinaliseer is.

Die geïdentifiseerde ontledingstemas is basseer op Donabedian se konsepsuele raamwerk, bestaande uit Struktuur (die versorgingsomgewing), Proses (die versorgingsmetodes) en Kwaliteitsversekering (die doelbewuste en beplande evaluering van gelewerde verpleegsorg).

Die navorsingsbevindinge het daarop gedui dat verskeie faktore 'n rol speel in die risiko-toename wat verband hou met personeel wat nie die kliniese agteruitgang in kinders wat in pediatriese sale verpleeg word, waarneem nie. Die faktore sluit in: die kinders se graad van siekte, personeeltekorte, opleidings tekortkominge ten opsigte van resussitasie- en die identifikasie van kliniese agteruitgang by kinders, tekorte aan genoegsame moniterings- en noodtoerusting in die sale, en onervare personeel.

Die waarneming van kliniese agteruitgang is wel bevorder deur spanwerk onder verpleegkundiges en ander mediese personeel, asook ouers wat betrokke was by die versorging van hulle kinders.

Die meerderheid van die navorsingdeelnemers was nie vertroud met 'vroeë waarskuwingsstelsel' nie, en het aangedui dat geen 'pediatriese vroeë waarskuwingsstelsels' beskikbaar is nie. Alhoewel hulle van mening was dat so 'n stelsel voordelig kon wees, het hulle bedenkinge gehad oor die tyd wat dit in beslag sou neem om die dokumentasie te voltooi, die opleiding wat hulle sou moes ontvang, en wat die moeilikheidsgraad van so 'n stelsel sou wees.

Die voortvloeiende aanbevelings van hierdie studie, wat die nie-herkenning van kliniese agteruitgang deur verpleegkundiges in pediatriese sale aanspreek, sluit in toepaslike kennis- en vaardigheids opdatering.

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LIST OF ACRONYMS

HIV/AIDS – Human immunodeficiency virus/acquired immunodeficiency syndrome

SANC – South African Nursing Council

TB – Tuberculosis

UK – United Kingdom

UN – United Nations

USA – United States of America

WHO – World Health Organisation

LIST OF ABBREVIATIONS

EWS – Early Warning Scores

MET – Medical Emergency Team

MEWS – Modified Early Warning Scores

PEWS – Paediatric Early Warning Scores

RRT – Rapid Response Team

CHAPTER 1

SCIENTIFIC FOUNDATION OF THE STUDY

1.1   INTRODUCTION

Unnoticed deterioration in the clinical condition of children in ward areas, can lead to near or actual cardiopulmonary arrest. This may also be termed a failure-to-rescue event (Ashcraft, 2006:211). Research indicates that in-ward cardiopulmonary arrests are associated with an increased mortality (McCabe & Duncan, 2008:24) as only about 20% of children who are treated for in-hospital cardiac arrest survive to hospital discharge (Brilli, Gibson, Luria, Wheeler, Shaw, Linarn, Kheir, McLain, Lingsch, Hall-Heiring, & McBride, 2007:237; Topjian, Berg & Nadkarni, 2008:1086; Tume, 2007:13).

Studies have shown that children suffering from a cardiac arrest in hospitals often display abnormal physiological parameters hours (i.e., within a 24 hour period) prior to this event occurring (Tume, 2007:12; Brilli et. al., 2007:242). Prevention of cardiopulmonary arrest in the wards lies in the ability of nursing and medical staff to be able to identify these abnormal physiological parameters, i.e., early signs of deterioration, and to intervene prior to this event (Tucker, 2008:79).

Numerous studies have shown that early identification of children at risk of deteriorating in a ward setting is possible with the implementation of either:

- A Paediatric Early Warning System (PEWS) which is a clinical tool designed to highlight normal and abnormal physiological parameters, (Monaghan, 2005:33; Haines, Perrot & Weir, 2006:79; Duncan, Hutchison & Parshuram, 2006:271; Tume, 2007:13; Tucker, Brewer, Baker, Demeritt & Vossmeyer, 2009:83; Parshuram, Hutchison & Middaugh, 2009:1);
- 'Calling criteria' to notify a rapid response team (RRT) (Sharek, Parast, Leong, Coombs, Earnest, Sullivan, Frankel & Roth, 2007:2267; Van Voorhis & Willis, 2009:924), a designated medical emergency team (MET) (Tibbals, Kinney, Duke, Oakley & Hennessy, 2005:1149; Brilli, et. al., 2007:237; Hunt, Zimmer, Rinke, Shilkofski, Matlin, Garger, Dickson & Miller, 2008:117; Tibballs & Kinney, 2009:306) , or an outreach team (Monaghan, 2005:33; Carter, 2008:51), or both (Haines, 2005:102-103).

However, before the implementation of a clinical tool or RRT/MET programme, several factors need to be taken into account for it to work effectively. It would be imperative to understand what the current knowledge, clinical practice and training of nurses is with regard to recognition of unexpected clinical deterioration in children in paediatric wards. A direct way to establish this is to elicit nurses' perceptions and experiences in this regard through conducting interviews.

1.2   RATIONALE AND LITERATURE REVIEW

The motivation for this study began when the researcher identified in her clinical practice the possible benefits of introducing a formal guideline on the early recognition of clinical deterioration in children which, according to the literature, may improve patient outcomes.

Several international studies have identified an increase in the acuity and complexity of the illness of children admitted to hospital wards over recent years (Day, Allen & Llewellyn, 2005:24-28; Tume & Bullock, 2004:21; Haines, 2005:98; McCabe & Duncan, 2008:24). This finding was supported by a study carried out at Red Cross War Memorial Children's Hospital, Cape Town, South Africa in 2007, where the increase in complexity of illness in children was particularly related to the high incidence of HIV infection, Tuberculosis and malnutrition (Weakley, Vries, Reichmuth, Pillay & Eley, 2009:58-59). Consequently, higher levels of care were required in the wards resulting in an increased workload on nursing staff (Weakley, et. al., 2009:59).

Furthermore, Tume and Bullock (2004:21) observed that nurses in wards have little or no critical care or high care training. This is also applicable in South Africa as supported by Carter (2008:50). Adding to this is the national shortage of ICU beds. According to a study carried out by Bhagwanjee and Scribante (2007:1311) in South Africa, only 19.6% of beds have been allocated to paediatric and neonatal ICU patients in the private and public sector. As a result, children who are critically ill are being nursed in the general wards when ICU beds are not available.

Considering the factors of increasing shortage of staff nationally (Provincial Nursing Strategy, 2009:15), the increase in complexity of illness in children seen in the wards, and staff inexperience, recognition of impending cardiopulmonary arrests may be overlooked.

As stipulated in the Constitution of South Africa (Children's Act, 38 of 2005:18), children

require a health care system that safeguards and promotes the wellbeing of the child. In South Africa, the Child Healthcare Problem Identification Programme (Child PIP) is a structured mortality review process to assess and improve the quality of care that children receive in the South African health system (Saving Children, 2009:2). According to Child PIP, the average in-hospital mortality rate between 2005 and 2009 was 5.9 per 100 admissions. Approximately 26% of these deaths were considered to be avoidable (Saving Children, 2009:4). Avoidable deaths were attributed to modifiable factors or specific instances of failure to meet particular standards of care which contributed to the child's death. According to Child PIP, the highest percentage of modifiable factors (27.2%) occurred in hospital wards. The most frequently listed of these were related to lack of ICU and high care facilities, lack of professional nurses and experienced doctor's in the wards, or due to deficits in clinical care received e.g. failure to monitor precise physiological parameters, namely, respiratory rate, oxygen saturation and glucose levels, as well as absence and/or faulty monitoring equipment.

In addition to this, the regulations in terms of the South African Nursing Act, 2005 (Act 33, of 2005) state that it is improper or disgraceful conduct for nurses to fail to maintain the health status of a patient under their care. Healthcare institutions, therefore, have an obligation to ensure that not only basic standards are adhered to and maintained but that their nursing staff receive training and regular updates in the recognition of patients at risk of cardiopulmonary arrest as well as in resuscitation protocols (Gabbot, Smith, Mitchell, Colquhoun, Nolan, Soar, Pitcher, Perkins, Phillips, King & Spearpoint, 2005:13; Saving Lives South Africa, 2005-2008:14; Resuscitation Council of Southern Africa, 2009:3). Failure to provide such a service has implications for clinical negligence.

Although hospital resuscitation programmes exist in academic hospitals in the Western Cape, in the researcher's experience as a Basic Life Support (BLS) instructor the resuscitation programmes utilised are not standardised throughout. The implication of this is that staff may not necessarily receive training in recognition of patients at risk of cardiopulmonary arrest, only training on actual resuscitation during the BLS course. In addition, doctors and nurses completing their studies in South Africa are required to do community service for a period of one year resulting in them travelling between different academic institutions where policies and guidelines are not necessarily standardised. This above information is supported by the Child Healthcare Problem Identification Programme (Saving Children, 2009:128) where they state that firstly, "there are several systems for providing emergency care to critically ill children in South Africa, but there is no national

consensus on the optimal system" and secondly, although, "Paediatric Life Support courses are provided countrywide, attendance of these courses is ad hoc, and no medical schools require certified training in emergency care as a prerequisite for graduation as a medical intern".

The researcher has experienced in her clinical practice in a private hospital the possible benefits of introducing a formal guideline on the early recognition of clinical deterioration in children based on physiological parameters which, according to the literature, may improve patient outcomes (Monaghan, 2005:35; Duncan, et. al. 2006:271; Haines, et. al., 2006:79; Parshuram, et. al., 2009:1).

1.3. SIGNIFICANCE OF THE STUDY

The literature indicates that the global concern of the poor percentage rate of survival to hospital discharge of in-ward paediatric cardiac arrests has led to the development of early warning identification programmes/systems. As discussed above, these programmes/systems can assist in the recognition and early treatment of the deteriorating paediatric patient in hospital wards.

The study aimed to determine nurses' experiences and perceptions with regards to their knowledge, clinical practice and training in the recognition of clinical deterioration in children. The output would record factors that enable and hinder nurses' ability to recognise clinical deterioration in children nursed in paediatric wards. In the light of this data elicited it could then be determined whether a formal guideline on the early recognition of clinical deterioration in children as well as standardised clinical protocols based on evidence-based practice would be perceived as being beneficial by the respondents in this study.

1.4   PROBLEM STATEMENT

It is unclear what factors assist or impede nurses in their clinical practice to be able to recognise unexpected clinical deterioration in children nursed in wards.

1.5. RESEARCH QUESTION

What are the perceptions and experiences of registered professional nurses working in paediatric wards with regard to their recognition of unexpected clinical deterioration in

children?

1.6. RESEARCH PURPOSE

The purpose of the study was to determine registered professional nurse's perceptions and experiences with reference to their knowledge, training and clinical practice in the recognition of unexpected clinical deterioration in children nursed in paediatric wards. The findings of the study would determine whether a formal guideline to assist nurses in the early recognition of clinical deterioration in children would be beneficial.

1.7. RESEARCH OBJECTIVES

The objectives for this study were to:

- explore positive experiences regarding recognition of clinical deterioration in children nursed in wards;
- explore negative experiences regarding recognition of clinical deterioration in children nursed in wards;
- explore perceptions regarding challenges in the current monitoring system pertaining to clinical deterioration in children;
- explore experiences regarding training specifically related to recognition of unexpected deterioration in children.

1.8. METHODOLOGY

1.8.1 RESEARCH DESIGN

The research design was an exploratory descriptive study, utilising a qualitative approach, to elicit perceptions and experiences of professional nurses in the recognition of unexpected clinical deterioration in children nursed in paediatric wards.

1.8.2 POPULATION AND SAMPLING

The population in this study comprised all registered professional nurses working in paediatric wards in academic hospitals in the Western Cape, South Africa. A purposive sampling technique was used to identify twenty (n=20) registered professional nurses

working at one academic hospital in Cape Town or until data saturation was reached.

1.8.3   SPECIFIC CRITERIA FOR INCLUSION

The professional nurses were registered with the South African Nursing Council (SANC) and were all working in paediatric wards in the designated academic hospital. All other categories of nurses were excluded.

1.8.4   PILOT INTERVIEW (PRETEST)

As recommended by Krueger (1998:Vol.3:57), a pilot interview was conducted on the first focus group comprising four participants of the main study. The pilot interview tested some of the practical aspects of the focus group environment such as the suitability of the interview venue from a privacy point of view. The relevance, clarity, order and effectiveness of the questions and interview guide was also established. Data collected from the pilot interview was included in the study as recommended by Krueger (1998:Vol.3:57).

1.8.5   DATA COLLECTION AND MANAGEMENT

Guidelines provided by Krueger (1998:Vol.6:97-100) on data collection and management thereof were utilised in this study. The researcher, along with an 'assistant moderator' (Krueger, 1998:Vol.6:49), conducted and recorded data from five focus groups. The first three focus groups comprised four members in each group as planned. The fourth focus group comprised three members and the fifth focus group comprised only two members due to participants cancelling at the last minute owing to work constraints. Therefore data was collected from seventeen (n=17) participants instead of the planned sample size of twenty (n=20). The focus groups were conducted in a comfortable, non-threatening environment and lasted approximately sixty to ninety minutes. Signed consent was obtained from each participant to participate in the study and for their responses to be recorded. The responses were coded to ensure confidentiality and anonymity. The focus group interviews were transcribed verbatim immediately after each interview from the tape recordings and from the interview notes taken by the assistant moderator and researcher. A backup copy of all transcribed data was kept.

1.8.6   INTERVIEW GUIDE

Krueger (1998:Vol.3:53) recommends consistency of questioning for all focus groups in order to compare and contrast emerging data dependably. In order to ensure consistency a formalised interview guide based on the objectives was used to facilitate each focus group interview process. The predetermined questions designed to engage the participants were concise and open-ended. The order of the questions proceeded from general to specific to allow the participants to become familiar with the interview process. Thus question categories each having distinct functions, as recommended by Krueger (1998:Vol.3:21-27), were used in the interview guide.

1.8.7   VALIDITY AND TRUSTWORTHINESS

The following principles as described by Lincoln and Guba (1985:290) were applied to this study to ensure validity and trustworthiness.

1.8.7.1   CREDIBILITY

Lincoln and Guba (1985:290) refer to credibility as the alternative to internal validity. The credibility of the study or the strength of the study was ensured by accurately describing and interpreting the perceptions and experiences of the participants. Experts in the field of research methodology were consulted to ensure that the topic was accurately identified and described according to content, research process and outcome.

1.8.7.2   TRANSFERABILITY

The transferability or generalisability of a study to other settings may be challenging in qualitative research (de Vos, Strydom, Fouché & Delport, 2005:346). To meet the criterion of transferability, the theoretical framework was specifically and unambiguously articulated; this will ensure that future researchers will understand and utilise the theoretical parameters in alignment with this study. The proposed theoretical framework for this study was based on Donabedian's Theory of Quality Health Care. Further aiding transferability, limitations in this study will be clearly described.

1.8.7.3   DEPENDABILITY

To ensure dependability of the process, which is the equivalent of reliability in the quantitative research paradigm (de Vos, et. al., 2005:346), two tape recorders were used and an assistant moderator took notes during the focus group interviews.   All focus group interviews were conducted by the researcher utilising the same procedure with the use of an interview guide.   All recorded and transcribed data were verified by a fellow researcher after each focus group interview.

In addition, de Vos, et. al. (2005:346) note in the qualitative paradigm that dependability relates to attempting to account for changing conditions in the social world that would require adjustments in researching the topic and the setting.   Thus, in meeting this aspect of the criterion of dependability, attention will be given to this aspect in Chapter 5 of the thesis.

1.8.7.4   CONFORMABILITY

According to de Vos, et. al. (2005:347), conformability or objectivity relates to whether the findings of the study can be verified or confirmed by another researcher/person.   Recorded and transcribed data were discussed and verified with the assistant moderator after each focus group interview to exclude bias.   During the focus group interviews the researcher clarified certain issues with the participants in order to establish that her understanding was accurately interpreted.

1.8.8   DATA ANALYSIS AND INTERPRETATION

According to de Vos et. al. (2005:311), the aim in focus group analysis is to look for patterns and trends within a single focus group and/or among various focus groups.   A 6 step systematic analysis process guide as described by Krueger (1998:Vol.6:10) was utilised in this study to ensure authenticity of results.

- The first systematic step involves the use of an interview guide and sequencing of questions similar for each group.
- The second systematic step includes the capturing and handling of data. Each focus group interview was recorded. The focus group interviews were transcribed verbatim immediately after the interview from the tape recordings and the field notes taken by the assistant moderator and the researcher. The researcher kept a master copy of all

transcribed data.

- The third systematic step involves the coding of data. The transcripts were examined closely for common phenomena, ideas and categories and codes were allocated according to the objectives.

- The fourth systematic step requires participant verification. The participants were given an opportunity to clarify key points whilst still in the focus group.

- The fifth systematic step involves debriefing between the researcher and the assistant moderator. Debriefing occurred between the researcher and the assistant moderator immediately after the focus group interviews in order to summarise and compare findings.

- The sixth systematic step involves distribution of the findings of the study with all participants via publications and oral presentations. The findings will be distributed to the appropriate hospital management on completion of the study.

1.9. ETHICAL CONSIDERATIONS

Participants in the study were assured by the researcher of anonymity, confidentiality and privacy and were informed that they may withdraw from the study at any given time without being penalised.   The participants, having been selected by the designated hospital's management, were therefore known to the relevant managerial decision makers.

Ethical approval of this study was obtained from the University of Stellenbosch's Ethics Committee (see Appendix A and B) and from the designated hospital management and ethics committee (see Appendix C).

1.10   CONCEPTUAL FRAMEWORK

This study was based on Avedis Donabedian's conceptual framework of quality health care (1966:166-206).   He proposed a model for assessing quality in health care based on structures, processes and outcomes. He defined 'structure' as the environment in which health care is provided and 'process' as the method by which health care is provided. 'Outcomes' is the consequence of the health care provided.

In this study, only the structure and process components of the above model of quality patient care were observed.

1.11   OPERATIONAL DEFINITIONS

Certain concepts have been used in the text of this study, and these are defined operationally below.

Clinical practice: Nurses who have a direct or an indirect patient care role are considered to be engaging in clinical practice (American Board of Nursing Specialities, 2010:5).

Critical care outreach programme: This refers to a programme for identifying and managing patients who are at risk of deteriorating. This programme has three components, namely, 1) use of a scoring system such as a PEWS to assist nursing staff at ward level to identify the deteriorating patient, 2) a referral algorithm to ensure early and appropriate interventions (usually a critical care outreach nurse is called), and 3) Training and skills development (Carter, 2008:51).

Experience: The knowledge or skill acquired by a period of practical experience of something, especially that which is gained in a particular profession (Oxford University Press, 2012). In the context of this study, experience refers to skill or knowledge obtained as the result of active participation or practice in the nursing profession.

MET – Medical Emergency Team: A team of experienced clinicians dispatched to evaluate and triage patients who are perceived to be clinically deteriorating in the general wards (Brilli, et. al., 2007:237).

Perception: The way in which something is regarded, understood, or interpreted (Oxford University Press, 2012).

PEWS – Paediatric Early Warning Scoring System: A clinical tool that can be used to assess the severity of a patient's illness by reviewing physiological parameters e.g. respiratory rate, heart rate, oxygen saturation, circulation and level of consciousness. If the patient's vital signs fall into any of the categories identified by the tool, then different staff responses are stipulated according to the referral algorithm (Tibballs, 2011:327).

Registered professional nurse: A person who is registered as such with the South African Nursing Council in terms of section 31 of the Nursing Act no. 33, of 2005 (South Africa, 2005:6).

RRT – Rapid Response Team: A team that consists of ICU trained personnel who are called to evaluate clinically deteriorating patients in the general wards (Hunt, et. al., 2008:117).

Unexpected clinical deterioration: An event or sequence of events that will indicate the deterioration in a patient's clinical condition. This change in clinical condition can manifest as abnormal vital signs, respiratory distress, seizures, airway obstruction or a decreased level of consciousness. Changes in clinical condition may not be limited to these signs but these are generally the ones first noticed (Advanced Paediatric Life Support, 2005:59-63).

1.12   TIME FRAME

The time frame for the completion of the entire study was two years. This included the proposal, ethical approval from the University and the designated academic institution, conducting the study, and submitting the completed thesis.

1.13   CHAPTER OUTLINE

This includes:

Chapter 1: Scientific foundation of the study

Chapter 1 describes the rationale, overview of the literature, the purpose, objectives, research methodology and definition of terms.

Chapter 2: Literature review

In Chapter 2 a literature review regarding factors related to recognition of unexpected clinical deterioration in children nursed in paediatric wards is discussed. The conceptual framework used in this study is also explained and discussed.

Chapter 3: Research methodology

Chapter 3 describes and explains the research methodology applied to this study.

Chapter 4: Data analysis, interpretation and discussion

Chapter 4 provides a discussion and presentation of the results obtained in this study.

Chapter 5: Discussion, conclusion and recommendations

Chapter 5 provides the discussion of final conclusions, limitations and recommendations related to this study.

1.14   SUMMARY

This chapter was an introduction to the study. The importance of recognition of unexpected clinical deterioration in children nursed in paediatric wards was highlighted. This chapter provided a brief overview of the research problem and the methodology used to conduct the research. Chapter 2 will discuss the related literature.

CHAPTER 2

LITERATURE REVIEW

2.1   INTRODUCTION

Chapter 2 presents an extensive review of the literature pertaining to and relevant to this study. According to Burns and Grove (2009:720), a review of the relevant literature is defined as 'the analysis and synthesis of research sources to generate a picture of what is known and not known about a particular situation or research problem'. In qualitative research, however, the timing of the review and the purpose thereof varies according to the type of study being conducted. In this study, the researcher conducted an initial literature review to determine what was known on the topic of clinical deterioration in children nursed in paediatric wards and to see how other researchers investigated the problem. After data analysis, the findings from the present study was then compared to further information obtained from the literature in order to determine similarities and to identify gaps in previous research.

At the United Nations summit in 2000, a consensus was reached on achieving set priority Millennium Development Goals (MDGs) and targets by the year 2015 (United Nations Development Programme South Africa, 2012:n.p). One of these goals was to reduce mortality rates of children under five years of age by two thirds between 1990 and 2015.

Globally, mortality rates of children under five years of age have fallen by more than one third according to the latest United Nations report (2012:26). In contrast, South African survey data analysis obtained from the period 1997 to 2007 shows little change, with the under five mortality rates remaining stagnant at 75 per 1000 live births (Nannan, Dorrington, Laubsher, Zinyakatira, Prinsloo, Darikwa, Matzopoulos & Bradshaw, 2012:28).

Adding to this, in South Africa, according to the Child Healthcare Problem Identification Programme (Child PIP), which is a structured mortality review process to assess and improve the quality of care that children receive in the South African health system, the average in-hospital mortality rate between 2005 and 2009 was 5.9 per 100 admissions. Approximately 26% of these deaths were considered to be avoidable (Saving Children, 2009:4).

Unnoticed deterioration in the clinical condition of children in ward areas can lead to near or actual cardiopulmonary arrest. Research indicates that in-ward cardiopulmonary arrests are associated with an increased mortality, an increased length of hospital stay and an increased need for mechanical ventilation (Tume, 2007:13). This would ultimately result in an increased cost to the facility and/or the child's family.

Prevention of cardiopulmonary arrest in the ward areas lies in the ability of nursing and medical staff to be able to identify the early signs of deterioration and to intervene prior to this event (Tucker, 2008:79). Early identification of children at risk of deteriorating in a ward setting is possible with the implementation of either a paediatric early warning identification system (Monaghan, 2005:33; Haines, et. al., 2006:79; Duncan, et. al., 2006:271; Tume, 2007:13; Tucker, et. al., 2009:83; Parshuram, et. al, 2009:1; Tibballs, 2011:327), or the implementation of a Rapid Response Team (RRT) (Sharek, et. al., 2007:2267; Van Voorhis & Willis, 2009:924) or Medical Emergency Team (MET) (Tibballs, et. al., 2005:1149; Brilli, et. al. 2007:237; Hunt, et. al., 2008:117; Tibballs & Kinney, 2009:306).

Currently, there is no evidence of paediatric early identification systems in use in paediatric wards at public hospitals in the Western Cape metropole, South Africa.

This literature review covers the following concepts:

- Improving the efficiency, quality and safety of patient care in health care establishments;
- Factors contributing to clinical deterioration in children in hospital;
- In-hospital cardiopulmonary arrests;
- The introduction of a Paediatric Early Warning (PEW) tool;
- The introduction of a rapid response team (RRT) or medical emergency team (MET) and the impact on improved patient outcomes/survival, and
- The feasibility of implementing a PEW system in a hospital.

Stellenbosch University' academic library and the following databases were used in sourcing the literature:

- Pubmed
- Medline
- E-journals

- Search engines

2.2 BACKGROUND LITERATURE

2.2.1 IMPROVING THE QUALITY OF PATIENT CARE

There has been a global initiative over the last couple of decades to promote and focus on the quality of health care (World Health Organisation (WHO), 2006:3).

The Institute of Medicine defines healthcare quality as the extent to which health services provided to individuals and patient populations improve desired health outcomes. The care should be based on the strongest clinical evidence and provided in a technically and culturally competent manner, with good communication and shared decision making (Pelletier & Beaudin, 2008:3).

In South Africa, many key interventions have been introduced over the last thirteen years to improve the efficiency, quality, safety of and access to healthcare (South African Department of Health Core Standards, 2011:1). In order to improve performance and the quality of care in South African health care establishments, National Core Standards were developed in order to standardise expected practice and to establish expected minimum safety standards. The National Core Standards are structured into seven domains and are defined as 'areas where quality or safety might be at risk'. The first three domains consist of patient rights; safety, clinical governance and care; and clinical support services. These domains represent the core of the health system for delivering quality healthcare to patients. The remaining domains consist of public health; leadership and corporate governance; operational management; and facilities and infrastructure. These domains are the support systems for healthcare delivery (Lourens, 2012:3).

The significance of this is that the system up until now in South Africa has been complex with standards and guidelines having been developed by numerous professional bodies and even private organisations nationally and provincially. This makes performance assessment and benchmarking between health care establishments and against national/international standards challenging. With the implementation of these national core standards, the conducting of clinical audits along with evidence-based processes linked to these standards can enhance personnel knowledge, the delivery of quality health care to patients and patient

safety (Lourens, 2012:3).   These Core Standards are still in the process of being implemented.

Currently, The Child Healthcare Problem Identification Programme (Child PIP) which was developed for the Medical Research Council in 2001, carries out a national structured mortality review process to assess and aims to improve the quality of care that children receive in the South African health care system. Child PIP extended its coverage from 19 South African hospitals in 2005, to 98 in 2009 (about 30% of all hospitals nationally). Although there are still no national implemented norms or standards for health resources or practice, the Child PIP audit system uses the South African Standard Treatment Guidelines for primary healthcare and for hospital paediatric care with local adaptations, the IMCI-guidelines and the South African National Norms and Standards for equipment in district hospitals. The performance of the health system is measured against these standards and thus substandard care can be identified and analysed. Child (PIP) has the following aims:

- To continue to collect demographic, social, nutrition, HIV, cause of death and modifiable factors data on children who die in South African hospitals to assess the quality of care;
- To analyse demographic and quality of care data for each of the leading causes of death, and
- To reinforce and update earlier recommendations for improving care and reducing child deaths.

The real strength of Child PIP is that through auditing, it encourages participating health establishments to reflect on their own service and to find ways of improving care. For example, it was reported that the in-hospital mortality rate of children in some participating hospitals had declined in 2009 by 17% since the implementation of the Child PIP programme (Wittenberg, 2011:26). This emphasises the need to continue to collect and analyse quality of care data in order to further reduce the in-hospital mortality rate of children.

The conceptual framework of the Child PIP programme bears a strong resemblance to Donabedian's (1966:166-206) theory for assessing quality in health care.

2.2.1.1   CONCEPTUAL FRAMEWORK

The conceptual framework deemed to be most applicable to this study was that of the theorist Avedis Donabedian.   Donabedian (1966:166-206; 1988:1743-1748) proposed a theory related to quality health care and a process for the evaluation thereof. Three objects of evaluation in the assessment of quality which were identified by Donabedian are Structure, Process and Outcome (see Figure 2.1).

STRUCTURE
(Including personnel, equipment, buildings, record systems, finance, supplies and facilities)

↓

PROCESS
(Incorporating all aspects of the performance, technical and interpersonal, of activities of care)

↓

OUTCOME
(The results of care/service)

Source: Whiteley *et al.* (1996)
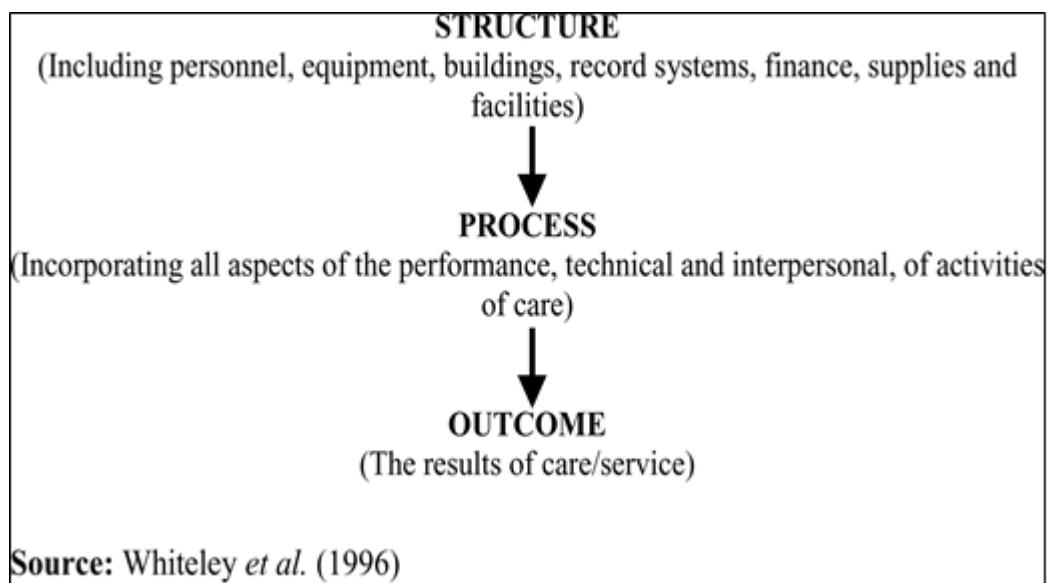
Figure 2.1: Model depicting quality assessment by Donabedian.

Donabedian defines Structure as the "setting in which health care takes place and the instrumentalities of which it is the product" (1966:170). This may include "the adequacy of facilities and equipment; the qualifications of medical staff and their organization; the administrative structure and operations of programmes and institutions providing care." Donabedian defines Process of Care as the method by which health care is provided (1966:169).   This includes but is not exclusive to the co-ordination, continuity and acceptability of the care rendered based on standards of care. According to Donabedian (1966:167), the Outcome of medical care can be assessed in terms of 'recovery, restoration of function and survival, which have all been used as indicators of the quality of medical care'.

According to Donabedian (1966:170), one then assumes that firstly, given the proper setting/environment and its instrumentalities, good medical care will follow, or secondly, when assessing Process of Care alone, despite medical technology or setting, the question is raised whether good medical care has been rendered. However, the limitation to this way of thinking is that 'the relationship between structure and process or between structure and outcome is not always established' (Donabedian, 1966:170). Hence, when assessing aspects of structure, process of care and outcome to determine quality in health care, the requirement is that they are measurable and are valid (Donabedian, 1966:189).

The relevance of Donabedian's theory to this study will be presented and discussed in further depth in chapter four.

2.2.2   FACTORS CONTRIBUTING TO CLINICAL DETERIORATION IN CHILDREN IN HOSPITAL

The Institute of Medicine suggests that nurses play a pivotal role in preventing patient complications, identifying incidences of risk, and activating appropriate responses and processes which are all functions essential for patient safety (Dresser, 2012:361).

According to McCabe and Duncan (2008:24), international studies have shown that "many factors contribute to the lack of early recognition and the provision of treatment for the deteriorating child including:

- The increasing acuity and complexity of patients cared for in the ward areas;
- The inability of junior medical and nursing staff to recognise serious illness;
- The lack of empowerment of staff to obtain assistance;
- The lack of readily available and appropriately trained medical staff;
- An inappropriate nursing skill mix;
- Incomplete education of staff".

Failure to recognise clinical deterioration can lead to life-threatening events which include cardiopulmonary arrest (McCabe & Duncan, 2008:24).

2.2.3   IN-HOSPITAL CARDIAC ARREST

The literature was reviewed in relation to research conducted highlighting the survival rate of children who suffer in-hospital cardiac arrests.

Outcomes from paediatric cardiac arrests in the 20th century were poor (Topjian, et. al., 2008:1086; Topjian, et. al., 2009:203). In the 21st century, research shows that children have a better rate of survival to hospital discharge than adults following cardiac arrests (Nadkarni et. al., 2006:50; Topjian, et. al., 2009:203).   However, percentage survival to hospital discharge in children following cardiac arrest remains a problem.

A retrospective cohort study undertaken in the USA concluded that children receiving in-hospital cardiopulmonary resuscitation (CPR) in hospitals with a higher level of paediatric physician staffing led to an improved 24-hour survival rate of 51% (Donoghue, Nadkarni, Elliott & Durbin, 2006:995).

Outcomes from paediatric cardiac arrest and CPR appear to be improving, however, system based approaches of prevention, such as METs and PEWS may decrease the incidence of in-hospital cardiac arrests even further (Topjian, et. al., 2009:203; Tibballs, 2011:322).

2.2.4   INTRODUCTION OF PAEDIATRIC EARLY WARNING (PEW) TOOLS

In a survey done in 2003 in 15 paediatric centres across the United Kingdom, Australasia and the United States of America, it was evident that the provision of care in paediatric wards was of major concern to health personnel. All hospitals visited had a system in place and a team who were called if a child collapsed; however, all were interested in the possibilities of a Paediatric Early Warning (PEW) tool or system that would alert staff to the actual severity of a child's condition (Haines, 2005:98).

A PEW score is a clinical tool that has been developed in order to identify children at risk of collapse (Tibballs, 2011:327; Roland, 2012:208).   The tool looks at a number of age-appropriate physiological parameters/variables, for example, respiratory rate, heart rate, blood pressure, neurological status and capillary refill time, and allocates a score to each parameter as they deviate from normal (a score of 0 is considered to be normal) (McCabe, Duncan & Heward, 2009:17; Tibballs, 2011:327). In addition to this, a referral algorithm was developed with a number of tools to prescribe the action to be taken by nursing staff based

on the PEW score. Actions, depending on the severity of the score, include informing the nurse in charge of the ward, increasing the frequency of observations, notifying the doctor, or calling out the medical team (Monaghan, 2005:34; Tibballs, 2011:327).

Tume and Bullock, in 2004, identified that based on the positive outcomes of introducing early warning scoring tools in the adult population (Tume & Bullock, 2004:21), the view was that firstly, there was demonstrable value in introducing PEW tools; and secondly, development and validation of a PEW tool based on appropriate paediatric physiological parameters was required..

According to multiple studies, early identification of children at risk of clinical deterioration is possible prior to a life-threatening event (Tibballs, et. al., 2005:1148; Duncan, et. al., 2006:271; Haines, et. al., 2006:102; Brilli, et. al., 2007:237; Sharek, et. al., 2007:2268; Hunt, et. al., 2008:118; Parshuram, et. al., 2009:3; Tibballs, 2011:322; Roland, 2012:208).

Several PEWS tools have been developed and evaluated internationally using various combinations of physiologic parameters in children (Monaghan, 2005:34; Duncan, et. al., 2006:275; Haines, et. al., 2006:73; Edwards, Powell, Mason & Oliver, 2009:602; Parshuram, et. al., 2009:4; Akre, Finkelstein, Liu, Vanderbilt & Billman, 2010:e763). The main findings from these studies are tabulated below (Table 2.1).

Table 2.1: Evaluation of Paediatric Early Warning Scores (PEWS).

Publication	Institution	PEW Tool	Main Findings
Monaghan, 2005	Royal Alexandra Children's Hospital, Brighton, UK	Bedside PEWS • First PEWS to be developed • Score based on behaviour, cardiovascular and respiratory status	• High scores of ≥ 4 resulted in 96% of these patients being seen by medical staff within 15 minutes with appropriate interventions commenced • Children showing signs of deterioration are therefore assessed timeously and receive optimum care • Staff felt more confident in caring for the acutely ill child.

Publication	Institution	PEW Tool	Main Findings
Haines, et. al., 2006	Bristol Royal Hospital for Children, Bristol, UK	Bedside PEWS • Based on age-appropriate clinical and physiological parameters	• Identified most but not all children at risk of deteriorating • Had a 99% sensitivity for identifying patients who were transferred to a higher level of care.
Duncan, et. al., 2006	Princess of Wales Children's Hospital, Birmingham, UK	Bedside PEWS • Based on age-appropriate physiological parameters	• Would have identified 78% of children resuscitated by the 'code blue' team • Identifies deteriorating patients with a minimum of one hour prior to cardiopulmonary arrest
Edwards, et. al., 2009	Children's Hospital for Wales, Cardiff, UK	Cardiff and Vale PEWS • Based on age-appropriate physiological parameters from the advanced paediatric life support (APLS) guidelines	• 30% of children in need of assistance would not have activated the system and 10% would have activated it unnecessarily • It was concluded that further studies were required
Parshuram, et. al., 2009	Hospital for Sick Children, Toronto, Canada	Bedside PEWS • Initial score complex and based on a summation of points for physiological status, treatment and known medical conditions • PEW tool refined to a 7-item score based on age-appropriate physiological parameters	• Quantified severity of illness in hospitalised children • Identified critically ill children with at least one hours notice
Akre, et. al., 2010	Children's Hospitals and Clinics of Minnesota, Minneapolis and St Paul, Minnesota, USA	PEWS Tool • Based on the Brighton tool developed by Monaghan (2005)	• PEWS can potentially provide a forewarning of > 11 hours before a RRT or 'code blue' event • PEWS supports early recognition of clinical deterioration • Promotes concise communication among care providers to alter plans of care in response to a change in the patient's condition

In summary, the above international studies have shown that the PEW score has significant potential to identify children at risk of deterioration in the ward areas and thus improve the quality and outcome of in-hospital care.

From a South African perspective, there is no published evidence that PEW scores have been developed and validated in this country or that existing PEW tools have been implemented in public hospitals in South Africa. However, a recent study conducted by Kyriacos in Cape Town, South Africa (Kyriacos, Jelsma & Jordan, 2011:311-330) evaluated the need, development and benefit of (Modified) Early Warning Scoring (MEWS/EWS) systems for adult patients nursed in general wards. A key issue discussed was that "although MEWS/EWS systems facilitate recognition of abnormal physiological parameters in deteriorating adult patients, there is no evidence that implementation of Westernised MEWS/EWS systems is appropriate in resource-poor locations". A recommendation from this study is that a MEWS/EWS system should be developed which is appropriate to developing countries.

2.2.5 INTRODUCTION OF RAPID RESPONSE TEAMS (RRT) OR MEDICAL EMERGENCY TEAMS (MET)

In addition to the development of PEWS tools internationally, other strategies, which include rapid response systems, have been developed to assist in the recognition of clinical deterioration in children nursed in hospital wards. The ultimate aim of these systems and tools is to prevent cardiopulmonary arrest (Tibballs, 2011:322).

Rapid response systems globally have different names and team compositions as well as choice of "calling criteria" or "activation triggers" (Tibballs, 2011:322). An in-hospital Medical Emergency Team (MET) was defined by Brilli, et. al. (2007:237) as a team of experienced clinicians and nurses who were called to evaluate, stabilise and triage clinically deteriorating patients in ward areas outside of the Intensive Care Unit (ICU) within 15 minutes after activation. A rapid response team (RRT) is similar to the MET described by Brilli, et. al., however it is composed of both doctors and nurses or only nurses, and a critical care outreach team (CCOT) is usually composed of nurses alone but with rapid access to medical assistance (Tibballs, 2011:322).

The main findings from studies pertaining to rapid response systems were presented by Tibballs (2011:325) and an adaptation of these are tabulated below (Table 2.2).

Table 2.2: Main outcomes from rapid response systems.

Publication	Institution	Response System and criteria	Main Findings
Tibballs, et.al., 2005	Royal Children's Hospital, Melbourne, Australia	MET • First published report • Composed of doctors and nurses • Specific 'calling criteria' to activate team. Based on age-appropriate physiological parameters, change in neurological status, oxygenation, signs of respiratory distress, general clinical condition, staff member or parent concerned about child	• Non-significant decreases in all cardiac arrest and death but elimination of preventable cardiac arrest and death
Brilli, et. al., 2007	Cincinnati Children's Hospital, USA	MET • Composed of doctors and nurses • 'Activation criteria' based on signs of respiratory distress, oxygenation, change in neurological status, staff or parental concern about the child	• Significant decreases in cardiopulmonary arrest rates per 1000 non-ICU admissions • Non-significant decreases in preventable cardiac arrest (43%) and death (55%)
Sharek, et. al., 2007	Lucille Packard Hospital, Stanford, USA	RRT • Composed of a doctor, ICU nurse and ICU trained respiratory therapist • 'Activation criteria' included staff concern about the child, acute change in respiratory rate, acute change in heart rate, acute change in oxygen saturation, acute change in blood pressure, and acute change in neurological status	• Significant reductions in all cardiac arrest (72%) and all deaths (18%) • 21 hospital deaths prevented annually
Hunt, et. al., 2008	John Hopkins Hospital, Baltimore, Maryland, USA	Paediatric RRT but referred to as PMET in the article • Composed of doctors, nurses, a respiratory therapist and a paediatric pharmacist • Activation 'triggers' included respiratory distress or worsening respiratory symptoms, decrease in oxygen saturation despite first-line interventions, seizures with apnoea, change in neurological status, abnormal heart rhythms, concerned staff or parent	• Significant reduction of respiratory arrests (73%) • No change in cardiac arrest

Publication	Institution	Response System and criteria	Main Findings
Tibballs, et. al., 2009	Royal Children's Hospital, Melbourne, Australia	MET • Composed of doctors and nurses • 'Calling criteria' essentially unchanged since previous study	Follow-up report on previous study conducted in 2005 • Significant reduction in all hospital deaths (34%), preventable cardiac arrest (55%) and death (87%) • 34 hospital deaths prevented annually

In summary, implementation of a MET or RRT has been shown to decrease in-hospital mortality rates outside of the ICU setting (Sharek, et. al., 2007:2267; Tibballs, et. al., 2009:306) as well as decrease code rates outside of the ICU setting (Brilli, et. al., 2007:, Sharek, et. al., 2007:2267; Hunt, et. al., 2008:117; Tibballs, et. al., 2009:306).

2.3   POSSIBLE BARRIERS THAT PREVENT IMPLEMENTATION OF A PEW SYSTEM OR RRT/MET

The literature was reviewed in relation to demands on staff in ward areas, recording of physiological data, PEW tools, staff perceptions, training required and the cost-effectiveness of implementing a PEW system or a RRT/MET.

As the acuity and complexity of the illness of children admitted to hospital wards over the last decade has increased, the demand on staff to be able to accurately assess and prioritise a child's needs has also increased (Haines, 2005:98; McCabe & Duncan, 2008:24). A number of authors has identified that children's physiological data are not being recorded appropriately (Monaghan 2005:35; Haines, et. al., 2006:78; Adshead & Thomson, 2009:23). As PEW scores rely on physiological data which needs to be assessed, inappropriate recording thereof may be a barrier to implementation of a PEWS system.

Another barrier to implementation of a PEWS system could be the lack of standardisation of PEWS tools (Duncan, 2007:828; Parshuram, et. al., 2009:9) and therefore there could be difficulties in deciding on the most appropriate tool for use in a selected population. Adding to this is the lack of standardisation of 'calling criteria' or activation 'triggers' required to activate a MET/RRT (Brilli, et. al., 2007:242; Edwards, et. al., 2009:604). According to Tibballs (2011:323), no rapid response system "activation triggers" or "calling criteria" have

been evaluated to determine their sensitivity and specificity in preventing cardiopulmonary arrest in children.

Furthermore, Monaghan (2005:35) identified that staff did not initially see why a PEWS was necessary as they "felt capable of recognising patients at risk of deteriorating." According to Tume (2007:15), on some occasions when both medical and nursing documentation was reviewed, there was clear evidence that there was no recognition of the seriousness of the situation at the time. One may characterise this kind of barrier as an incorrect perception by nursing staff of their own level of competence in recognising deterioration. A survey on staff experience was conducted on completion of Monaghan's study (2005:35). It was reported that the PEWS system as well as the implementation of an outreach service like a RRT improved nursing staffs' confidence in recognising the child at risk of deterioration.

Nursing staff were also concerned about the PEW score assessment being time-consuming and adding extra paperwork to their already busy workload (Monaghan, 2005:35). This was supported by Duncan, et.al. (2006:277) who stated that the usability of the PEW tool, the workload related to scoring a patient, and the extra time needed for staff to score a patient were all issues that needed to be addressed. Monaghan calculated how long it would take to score a patient. It was determined that it would take 30 seconds over and above the time taken for a standard set of observations, and incorporating a PEW score into the standard observation chart prevented the need for additional paperwork (Monaghan, 2005:35). Tucker, et. al. (2009:84) supported the findings in Monaghan's survey as they reported that nurses found minimal to no time delay in calculating a PEW score (15 to 30 seconds); in addition staff felt empowered to make independent clinical decisions after the introduction of PEWS.

Another possible barrier to implementation is both the costs and the perceived cost-effectiveness or lack thereof of introducing a PEWS system and a MET/RRT. Introduction of a PEWS system would require sufficient resources to put an education programme in place for all hospital staff; as well as a means to evaluate the system (Haines, 2005:102). In addition, Sharek, et. al. (2007:2274) noted the need for further investigation into the financial aspects of implementing a rapid response system. Numerous studies (Brilli, et. al., 2007:237; Hunt, et. al., 2008:119; Tibballs & Kinney, 2009:307) have alluded to the resources and training required to implement a RRT/MET, however there was no mention related to the cost or ultimately the cost-effectiveness thereof.

In order to implement a PEWS and/or a rapid response system, education of staff as well as hospital management support of such a programme is required. There is ample evidence to support the former; different authors have identified the importance of targeted training and development that empowers personnel to utilise PEWS and rapid response systems effectively (Haines, 2005:102; Brilli, et. al., 2007:237; Hunt, et. al., 2008:119; McCabe & Duncan, 2008:24; Tucker, et. al., 2009:84; Tibballs, 2011:328). Furthermore, Hunt, et. al. (2008:119) state that after educational intervention, staff were 68% more likely to call for assistance. Regarding the latter (management support), various authors report on the importance of this for cultural change and for its role in sustaining a PEWS and/or RRT/MET programme (Brilli, et. al., 2007:237; Hunt, et. al., 2008:122; McCabe, Duncan & Heward, 2009:15; Tibballs, 2011:322).

2.4   SUMMARY

The salient points identified in the literature on recognising clinical deterioration in children nursed in paediatric wards are summarised below.

A PEWS system provides a means for the direction of care in association with clinical examination and it increases the confidence of nursing staff in the recognition of clinical deterioration in children (Monaghan, 2005:35; Tucker, et. al., 2009:84; Parshuram, et. al., 2009:9). As discussed above, several international studies have shown that the PEW score has significant potential to identify children at risk of deterioration in the ward areas and thus improve the quality and outcome of in-hospital care (Monaghan, 2005:34; Duncan, et. al., 2006:275; Haines, et. al., 2006:73; Edwards, Powell, Mason & Oliver, 2009:602; Parshuram, et. al., 2009:4; Akre, et. al., 2010:e763).

In addition to this, the success of introducing a MET or RRT in paediatrics has also been established (Sharek, et. al., 2007:2267; Brilli, et. al., 2007:236; Sharek, et. al., 2007:2267; Hunt, et. al., 2008:117; Tibballs, et. al., 2009:306).

According to Haines (2005:102), to ensure early identification and the timely and appropriate treatment of sick children in hospital wards, the following aspects would potentially need to exist: a validated PEW score tool; an appropriate and experienced team of health professionals to care for these sick children; an education programme for all hospital staff; and a means to evaluate the system that has been put into place. Furthermore, Haines

advises that specific needs of individual hospital environments would also have to be taken into consideration prior to the implementation of such a system.

It also stands to reason that providing training and personnel and the resources for maintaining a PEWS system and a MET requires a budget allocation. For those hospitals or organisations that can provide such a budget, this would represent an important enabling factor. According to Tibballs (2011:322), the introduction of these systems is a culture change which requires institutional adoption and extensive education in the recognition of the seriously ill child in order to effectively prevent life threatening events in hospital.

From a South African perspective, prior to the implementation of such a programme, a survey would be required to assess the following:

- Staff perceptions
- Current monitoring practices
- Available resources
- Nurse : patient ratios, and
- Doctor : patient ratios

2.5. CONCLUSION

With the above literature review in mind, there is ample evidence to support the need for strategies to enhance the abilities of nursing staff to recognise clinical deterioration in children in wards. Certain authors have also recommended that the nature of such strategies be matched to the unique contexts of individual institutions.

The current research study is about understanding the perceptions of nurses in a South African context who would be required to utilise these recognition strategies. Chapter three describes the methodology used in this study.

CHAPTER 3
RESEARCH METHODOLOGY

3.1   INTRODUCTION

Chapter 1 provided an orientation to the study and Chapter 2 included a comprehensive literature review relating to the context of the study. This Chapter describes the research methodology utilized in this study. Included in this discussion is the goal of the study and the objectives, the research design, population and sampling methods used, data collection process, and data analysis and interpretation methods used.

The process or plan for conducting the specific steps of a study is referred to as the research methodology (Burns & Grove, 2009:719). Once the researcher has identified the research problem and the purpose or goal of the research, the appropriate research process or methodology can then be established.

3.2   RESEARCH QUESTION

A research question is a concise, interrogative statement that includes one or more variables or concepts (Burns & Grove, 2009:167) and it shapes decisions about gathering data (de Vos, et. al., 2005:91).

The question directing this study was: What are the perceptions and experiences of registered professional nurses working in paediatric wards with regard to their recognition of unexpected clinical deterioration in children?

3.3   RESEARCH PURPOSE

The research purpose is a concise, clear statement of the specific goal or aim of the study (Burns & Grove, 2009:87). The purpose of this study was to determine registered professional nurses' perceptions and experiences regarding their knowledge, training and clinical practice in the recognition of unexpected clinical deterioration in children nursed in paediatric wards. The findings of the study would then determine whether a formal guideline to assist nurses in the early recognition of clinical deterioration in children would be beneficial.

3.4   RESEARCH DESIGN

The research design refers to the overall plan for collecting and analysing the data or, as defined by Burns and Grove (2009:696), it is "the blueprint for conducting the study that maximises control over factors that could interfere with the validity of the findings."

An exploratory descriptive design, utilising a qualitative approach, was applied to elicit perceptions and experiences of registered professional nurses in the recognition of unexpected clinical deterioration in children nursed in paediatric wards.

"The various strategies of enquiry used by qualitative researchers differ depending on the purpose of the study, the nature of the research question, and the skills and resources available to the researcher (de Vos, et. al., 2005:83.)" Exploratory research "provides the basis for confirmatory studies and is designed to increase the knowledge of a field of study" (Burns & Grove, 2009:700). Adding to this, a descriptive design is applied when the researcher wishes to develop theory, identify problems with current practice, make judgements, or determine what others in similar situations are doing" (Burns & Grove, 2009:237). The chosen design guided the researcher to elicit registered professional nurses' experiences and perceptions with regards to recognition of unexpected clinical deterioration in children in their care.

The conceptual framework for this study was based on Avedis Donabedian's conceptual framework of quality health care (1988:1743-1748) as discussed in Chapter 2. The framework guided the researcher in being able to link the findings of the study to the environment and the method in which the health care was provided.

The fact that a conceptual framework was applied to sort and analyse the data indicates that the methodological approach was predominantly deductive which is reflected in the chosen design. In addition, the instrument used for gathering the data from the focus groups, posed set questions across all the interviews. This approach is consistent with an exploratory descriptive design.

3.5   POPULATION AND SAMPLING

Burns and Grove (2009:714) define the population of a study as "all elements (individuals, objects, events, or substances) that meet the sample criteria for inclusion in a study; sometimes referred to as a target population." The target population in this study comprised all registered professional nurses working in paediatric wards in academic hospitals in the Western Cape, South Africa.

Burns and Grove (2009:721) define the sample of a study as "the subset of the population that is selected for a study."   The sample in this study comprised seventeen (n=17) registered professional nurses working in paediatric wards at one academic hospital in Cape Town, South Africa. Non-probability sampling methods are generally used in qualitative research (Burns & Grove, 2009:355) and a purposive sampling or selective sampling technique was used in this study to identify twenty (n=20) registered professional nurses working at the designated hospital or until data saturation was reached. Participants who fitted the inclusion criteria for the study and who were working in a paediatric ward on the days the study was to take place were selected by the hospital's management and clinical department. Participants were then invited to take part in focus group interviews with the researcher and an assistant moderator by the designated hospital.

According to Burns and Grove (2009:361), "the number of participants in a qualitative study is adequate when saturation of information is achieved in the study area i.e. additional sampling provides no new information." Due to the nature of the topic and the quality of the data obtained, data saturation appeared to be achieved in this study with a sample size of seventeen (n=17) participants.

3.5.1   INCLUSION CRITERIA

Inclusion sampling criteria is described as "sampling requirements identified by the researcher that must be present for the element or subject to be included in the sample (Burns & Grove, 2009:703)".   Registered professional nurses registered with the South African Nursing Council (SANC) and working in paediatric wards in the designated academic hospital were included in the study.

3.5.2   EXCLUSION CRITERIA

Exclusion sampling criteria is described as "sampling requirements identified by the researcher that eliminate or exclude an element or subject from being in a sample" (Burns & Grove, 2009:699).   All other categories of nurses working in the designated academic hospital in paediatric wards were excluded.

3.6   INSTRUMENTATION

Focus group interviews (FGI) were designed to obtain research participants' perceptions pertaining to a specific or focused area of study (Burns & Grove, 2009:513).   Krueger (1998:Vol.3:9) describes two questioning strategies commonly used for FGI, namely, the topic guide and the questioning route or guide.   Krueger (1998:Vol.3:10) states that the questioning route is often preferable in academic environments.   Krueger also recommends consistency of questioning for all focus groups in order to compare and contrast emerging data dependably (1998:Vol.3:53).

3.6.1   INTERVIEW GUIDE

In order to ensure consistency between focus groups in this study, a formalised interview guide based on the objectives was compiled by the researcher and was used to facilitate each focus group interview process. A strategy recommended by Krueger (1998:Vol.3:57) is to separate the pilot testing of questions from the pilot testing of the focus group. Pilot testing of questions can be done by testing the questions on other researchers who have an understanding of the context of the research, or with a focus group expert, or with potential participants and non-researchers (Krueger, 1998:Vol.3:53). In this study the questions in the interview guide were reviewed and tested with an independent researcher and the assistant moderator who had an understanding of the context of the research and who had experience with the interviewing process.

The predetermined questions in the interview guide used in this study were concise and open-ended. The order of the questions proceeded from general to specific to allow the participants to become familiar with the interview process.   Question categories as recommended by Krueger (1998:Vol.3:21-27) were used in the interview guide, as one of the features of focus group interviews is that there are different types of questions each having distinct functions. The five question categories are: opening, introductory, transition, key,

and ending. These question categories are explained below (3.6.1.1) and illustrated (See Figure 3.1:33).

3.6.1.1   INTERVIEW GUIDE QUESTION CATEGORIES FOR THIS STUDY

Opening questions

An opening question is answered by each participant at the beginning of the FGI and is preferably based on facts as opposed to opinions (Krueger, 1998:Vol.3:23). The main purpose of this category of questions is to help people feel at ease and to create a sense of kinship once they have heard responses from other participants. For this study the facts gathered were also captured as demographic information. The participants in this study were asked where they work, how long they had been working in that area and how long they had been registered professional nurses.

Introductory questions

Introductory questions are used to introduce the general topic of discussion and/or to give participants an opportunity to reflect on their general experiences (Krueger, 1998:Vol.3:24). The questions promote conversation and interaction among participants. The participants in this study were asked to reflect on some of their positive experiences of working in their academic institution and the types of patients they were seeing in their paediatric wards.

Transition questions

The aim of transition questions is to serve as a link between the introductory questions and the key questions that drive the study (Krueger, 1998:Vol.3:25). Participants were asked to discuss their understanding of unexpected clinical deterioration in a child in order to envision the context of the study in a broader scope, and to see how others view the topic.

Key questions

According to Krueger (1998:Vol.3:25), key questions are "what drives the study." These questions assist the researcher in gaining insight into the participants' perceptions and experiences specifically related to the topic. Participants were asked questions related to factors involving recognition of clinical deterioration in children, call procedures, management of a child whose condition is deteriorating, training, and additional systems that could be put into place to assist the staff.

Ending questions

Ending questions normally bring closure to the study (Krueger, 1998:Vol.3:26). This is a chance to recap on or review questions with the participants and to determine from the participants whether in their opinion anything was missed. Participants were asked their opinions on whether a formal guideline that could assist them in the early recognition of clinical deterioration would be beneficial to them. They were also asked whether in their view there was any other information they would like to add.
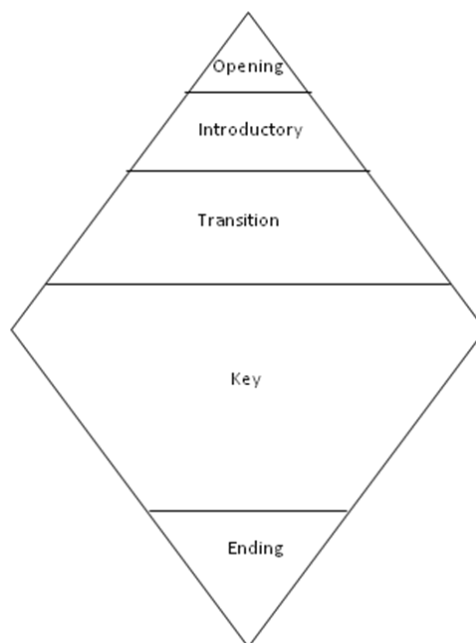
Figure 3.1: Question category hierarchy illustration

3.7   PRETEST (PILOT INTERVIEW)

A pilot study is conducted on a lesser version of the proposed study to develop and refine the methodology, instrumentation, or data collection process (Burns & Grove, 2009:713). Krueger (1998:Vol.3:57) stated that the true pilot test is the first focus group with participants. A pilot interview was therefore conducted on the first focus group comprising four participants of the main study. This tested some of the practical aspects of the focus group environment such as the suitability of the interview venue from a privacy point of view as well as the relevance, clarity, order and effectiveness of the questions.

Another aspect that was tested in the first focus group was the group size. De Vos, et. al.

(2005:305) state that focus groups usually include six to ten participants, and Morgan and Scannell (1998:Vol.2:71) mention that four to six people are preferable when the participants have a great amount of experience related to the topic. Larger groups may also require a higher level of facilitator involvement (de Vos, et. al., 2005:305).

The outcome of the first focus group was that the venue, procedures and questions were found to be satisfactory to the researcher, assistant moderator and the participants. The researcher determined that the size of the group (i.e., four participants) was appropriate as the group provided a large amount of data, and the researcher was able to facilitate the levels of group interaction comfortably. Thus the planned methodology with its instrumentation and procedures was verified.

3.8   VALIDITY AND TRUSTWORTHINESS

The "validity of a study is the measure of the truth or accuracy of a claim which is an important concern throughout the research process (Burns & Grove, 2009:727)". As qualitative research is a subjective approach used to describe life experiences (Burns & Grove, 2009:717), the concepts of validity and reliability are not addressed in the same way as with quantitative research. According to Morse (1994:4), the soundness or validity has to do with the certainty of the qualitative results. Therefore researchers should ensure reliability and validity by implementing verification strategies throughout the study.

Some researchers have suggested adopting criteria for determining reliability and validity in qualitative research due to the differences in quantitative and qualitative paradigms (Lincoln & Guba, 1985:290). Although Miles and Huberman (1994:277-280) describe 12 strategies for examining the validity of qualitative studies, they discuss five main and overlapping criteria linked to the criteria discussed by Lincoln and Guba (1985:290). Lincoln and Guba proposed four criteria, namely, credibility, transferability, dependability, and conformability, to establish the "truth value" or trustworthiness in qualitative research. These criteria will be discussed below in relation to this study.

3.8.1   CREDIBILITY

Lincoln and Guba (1985:290) refer to credibility as the alternative to internal validity. The aim of this criterion is for the researcher to be able to demonstrate that all aspects of the study were accurately identified and described (de Vos, et. al., 2005:346). This will include how

the results of the data obtained are described in the context of the research problem, study setting, population and theoretical framework.

The researcher addressed credibility in this study in the following ways:

- An extensive literature review was conducted throughout the research process;
- All aspects of the study were accurately identified, described, and verified with the study supervisor. These included the research problem, study setting, population and sampling, research methodology, data collection methods and analysis, and interpretation of the findings;
- An expert in the field of research methodology was consulted to ensure that the topic was accurately identified and described according to content, research process and outcome.

3.8.2   TRANSFERABILITY

Lincoln and Guba (1985:290) refer to transferability as the alternative to external validity or generalisability. This translates as the degree to which the findings can be applied to other contexts. According to de Vos et. al. (2005:346), the transferability or generalisability of a study to other settings may be challenging in qualitative research. To deal with these challenges it is suggested that the researcher shows how data collection and analysis was guided by concepts and models of the original theoretical framework. To meet the criterion of transferability in this study, the researcher addressed the following:

- The theoretical framework was specifically and unambiguously articulated to ensure that future researchers will understand and utilise the theoretical parameters in alignment with this study;
- Limitations in this study are clearly described by the researcher, further aiding transferability.

3.8.3   DEPENDABILITY

Dependability is the equivalent of reliability in the quantitative research paradigm (de Vos, et. al., 2005:346). According to Miles and Huberman (1994:278), this criterion relates to consistency in the process of the study and relative stability over time and across researchers and methods. De Vos et. al. (2005:346) notes that in the qualitative paradigm

dependability relates to attempting to account for changing conditions in the social world that would require adjustments in researching the topic and the setting. To meet the criterion of dependability in this study, the researcher ensured the following:

- All focus group interviews were conducted by the researcher utilising the same procedure with the use of an interview guide;
- Two tape recorders were used and an assistant moderator took field notes during the focus group interviews;
- All recorded data as well as the field notes were verified by the assistant moderator and the researcher after each focus group interview;
- The transcribed data and the coding procedure were verified with the assistant moderator during the analysis process.

3.8.4   CONFORMABILITY

According to de Vos et. al. (2005:347) the construct conformability in qualitative research is the alternative to objectivity in quantitative research. Lincoln and Guba (1985:20) stress the importance of whether the findings of the study can be verified or confirmed by another researcher/person. The focus is not on the researcher's "objectivity" but rather that the research process can be judged as appropriate, accurate and transparent. The researcher ensured conformability in this study in the following ways:

- The research process, all recorded and transcribed data, and the research findings were verified with the assistant moderator.
- During the focus group interviews the researcher clarified certain issues with the participants in order to establish that their understanding was accurately interpreted.
- An extensive literature review was conducted during the analysis in order to relate the findings of this study to previous research.
- Study material, namely, field notes, transcribed data and coded data have been retained by the researcher. No names of participants were included in this material.

3.9   DATA COLLECTION PROCESS

Data collection is the "precise, systematic gathering of information relevant to the research purpose or the specific objectives, questions, hypotheses of a study" (Burns & Grove, 2009:695). The qualitative research method used in this study to collect data was the use of

focus group interviews. Morgan (1998:Vol.1:11) describe focus groups as guided group discussions that generate a rich understanding of participants' experiences and beliefs on a topic determined by the researcher.

3.9.1   RATIONALE FOR USING FOCUS GROUP INTERVIEWS

One of the primary reasons for the use of focus group interviews (FGI) in this study was that this method enabled the researcher to collect data through group participation and interaction as opposed to one-to-one interviews. The researcher was able to identify perceptions and experiences that the participants had in common as well as discover the differences in their experiences through interaction and communication with each other. Morgan (1998:Vol.1:33) states that individual and group interviews generate different kinds of data. Individual interviews may provide insight into an individual's unique experiences whereas group interviews engage the participants in active comparisons of their perceptions and experiences. This rationale is also consistent with the opinion of de Vos et. al. (2009:301), who advocate that focus groups create a process of "sharing and comparing" among participants.

3.9.2   PARTICIPANT SELECTION

The researcher had a meeting with the nursing manager of the chosen academic institution prior to conducting the study in order to discuss the purpose of the study, criteria for participant selection, study venue requirements and proposed study dates.

Five focus group interviews comprising four participants in each group were planned for over a period of three days that were suitable to the management and the researcher. Due to the constraints of staff availability, the nursing management was unable to allocate more than four participants to a group at a time; the contingency plan to allow for no-shows as advocated by Morgan and Scannell (1998:Vol. 2:103-105) was therefore not available to the researcher.

In addition, participants who met the inclusion criteria for the study were selected by the management and the clinical department of the designated institution and not by the researcher. This was a deviation from the desired procedure where the researcher would personally contact and invite participants to attend the focus group interviews. This will be discussed further under the limitations section in this study.

Participants were selected in advance of the dates of the interviews and were thus given reasonable notice of their intended participation. However, as the researcher did not personally recruit the participants, their knowledge of the research topic prior to their attendance may have been limited. This was addressed by the researcher on the days of the interviews.

3.9.3   VENUE

A comfortable, non-threatening environment that meets the needs of both the researcher and the participants' is recommended when conducting focus group interviews (de Vos, et. al., 2005:309; Morgan & Scannell, 1998:Vol.2:21). The first three focus group interviews were conducted in a private office in the management suite of the designated academic institution. The fourth and fifth focus groups were conducted in a private office in the training department of the designated academic institution. Both venues were comfortable and easily accessible to the participants in the study as recommended by Morgan and Scannell (1998:Vol.2:122). Comfortable chairs arranged in an oval layout were provided to allow for ease of communication and observation between the participants and the researcher.   The participants were also able to communicate effectively with minimal distractions in the designated venues and the researcher and assistant moderator were able to observe and record the data efficiently. Snacks and light refreshments were provided to create a relaxed, comfortable atmosphere as suggested by Morgan and Scannell (1998:Vol.2:128).

3.9.4   CONDUCTING THE FOCUS GROUP INTERVIEWS

The researcher, along with an assistant moderator, conducted five focus group interviews over a period of two weeks on three allocated days. The first three focus groups comprised four members in each group as planned. The fourth focus group comprised three members due to staff shortages and availability of the selected fourth participant. The fifth focus group comprised only two members due to two participants cancelling at the last minute owing to work constraints. Even though there were three no-shows in the last two focus groups, the researcher made the decision to proceed with the interview. These groups were included in the study as the participants might have provided valuable information due to their vast experience. This decision was supported by Morgan and Scannell (1998:Vol.2:103) where they acknowledge that a smaller group of two to four participants can still yield valuable information in the event of scheduled participants failure to show up.

The seventeen participants were working in various paediatric disciplines/wards, namely, oncology, surgical ward, medical ward, medical and surgical speciality wards, day surgical ward, and medical short stay ward. Of relevance to this study is the stipulation that they were all working in paediatric wards, and these wards also had high care units attached to them.

Prior to each focus group interview, the researcher ensured that the allocated venue was ready and that two recording devices were set up and in working order as suggested by de Vos, et. al. (2005:310). Both recording devices were visible and permission to audiotape each session was obtained by each participant.

Each focus group interview was conducted in a similar manner. The researcher extended a warm welcome to all the participants and thanked them for agreeing to take part in the study. An overview of the topic and the purpose of the research were provided by the researcher prior to commencing the interviews. All participants signed consent to participate in the study and for their responses to be recorded. The researcher emphasised the fact that all information obtained would remain confidential and, by allocating a number to each participant, their responses would remain anonymous when the data was transcribed. The assistant moderator was introduced to the participants and the purpose of her taking field notes was explained to them. Field notes included seating arrangements, participants' qualifications and experience, verbal and non-verbal communication highlights and emerging themes that were identified.

In order to ensure consistency between focus groups (Krueger, 1998:Vol.3:53), a formalised interview guide (see Appendix E) as discussed above (3.6.1) was used to facilitate each focus group interview process. The researcher used open-ended, probing questions during the FGI to encourage the participants to express their opinions and elaborate on the topic. Interview skills such as listening, probing, and directing were used by the researcher in order to keep the discussion flowing. Another skill involved clarification to ensure that the participants' responses were understood by the researcher. Each FGI ranged between sixty to ninety minutes.

3.10 ETHICAL CONSIDERATIONS

Research ethics involves the application of various ethical codes and regulations that govern

scientific research (Burns & Grove, 2009:184). To protect the rights of the participants and to ensure ethical conduct in this study the researcher adhered to the following ethical considerations.

3.10.1   AUTHORISATION TO CONDUCT RESEARCH

A research proposal was submitted to the Health Research Ethics Committee (HREC) of the University of Stellenbosch for ethical approval. Formal permission to conduct this study was granted by the HREC, reference number N10/11/399 (see Appendix A and B). Approval was then obtained from the designated hospital's management and ethics committee (see Appendix C).

3.10.2   INFORMED CONSENT

As discussed previously, the researcher was personally not able to recruit the participants for this study. Therefore an overview of the topic and the purpose of the research were provided by the researcher to the participants immediately prior to commencing all interviews. All participants then signed a written consent to participate in the study and for their responses to be audio recorded (see Appendix D). Emphasis was placed by the researcher on voluntary participation and the right to withdraw from the study without being penalised or prejudiced in any way.

3.10.3   RIGHT TO PRIVACY, ANONYMITY AND CONFIDENTIALITY

Every participant has the right to privacy on the basis of anonymity and confidentiality (Burns & Grove, 2009:196). Privacy is one of the predominant ethical concerns in focus group research as it involves the sharing of information among participants (Morgan & Scannell, 1998:Vol.2:87). Along with this is the fact that the participants were working in the same institution and therefore the focus group interviews were unable to offer participants true anonymity; however, procedures to maintain confidentiality are crucial. The researcher addressed this in the following way:

- Immediately prior to each focus group interview, the researcher emphasised that all information obtained would remain confidential and, by allocating a number to each participant, their responses would remain anonymous when the data was transcribed.

- The researcher avoided identifying the participants by name during the focus group interviews.

- Each participant was allocated a number on the transcribed data. References to participants' names were excluded from the data.

- The transcribed data collected from all focus groups were analysed together so that a participant or group of participants could not be identified by their responses.

- Only the researcher has access to the transcribed data, field notes and audio tapes. These, along with the results, will be kept in a secure destination by the researcher for a period of five years on completion of the study.

3.10.4   RIGHT TO BE PROTECTED FROM DISCOMFORT AND HARM

The principle of beneficence requires the researcher to "do good and above all to do no harm (Burns & Grove, 2009:188)". The research study did not involve any interventions that may have harmed the participants. The venues provided were private, comfortable and easily accessible to the participants in the study. Some participants may have experienced concerns regarding the duration of the focus group interviews, and for those who expressed a need to return to their place of work in time, the researcher was able to assure them that the interview would be completed punctually.

3.11 DATA ANALYSIS

Data analysis is the process of reducing, organising, structuring and thereby giving meaning to the collected data (de Vos, et. al., 2005:333; Burns & Grove, 2009:695). According to de Vos, et. al. (2005:311), the aim in focus group analysis is to look for patterns and trends within a single focus group and/or among various focus groups. According to Krueger (1998:Vol.6:10), the purpose of the study should drive the analysis. A 6 step systematic analysis process guide as described by Krueger (1998:Vol.6:10) was utilised in this study to ensure authenticity of results as follows:

Step 1: Sequencing of questions

- An interview guide was used for each FGI and consisted of questions that proceeded from general to specific to allow the participants to become comfortable with the interview process. The sequencing of questions by means of utilising question categories with distinct functions (see 3.6.1 above) allowed the participants to become familiar with the topic, to discuss personal opinions and to hear the opinions of others.

Step 2: Capturing and handling of data

- Each FGI was recorded using two recording devices for contingency purposes. The researcher then listened to the recordings after each FGI in order to confirm critical elements during the interviews. The recorded data was then transcribed verbatim by the researcher and a designated transcriber. Tape recordings were repeatedly listened to by the researcher to ensure the accuracy of the data transcribed. In addition, the researcher and an assistant moderator took field notes during each interview. These were utilised subsequently to recall observations made by the assistant moderator and the researcher during each FGI. A master copy of all transcribed data and field notes was kept by the researcher.

Step 3: Coding of data

- According to Corbin and Strauss (2008:159), coding is the extracting of concepts from raw data and developing them in terms of their properties and dimensions. The transcribed raw data in this study was grouped together or linked into themes or higher-level concepts based on the research objectives. Each theme was then broken down into subthemes which sorted the data into categories that were based on Donabedian's conceptual model of quality in health care. The raw data was then scrutinised to identify lower-level concepts or similar ideas that emerged and abbreviations or codes were applied to the margins of the transcribed data. Related lower-level concepts were grouped together into clusters and it was determined whether they fit into existing themes or whether new themes emerged. This helped the researcher to describe conceptually what themes were indicated by the data. All transcribed data and the coding thereof was verified with the assistant moderator and supervisor of this study.
- Miles and Huberman (1994:10) refer to this process of summarising data, coding, identifying themes in the data and making clusters as *data reduction.*

Step 4: Participant verification

- This step verifies that the researcher has adequately understood the intent or the meaning of what has been said by the participants. During the focus group interviews the researcher and the assistant moderator clarified certain issues with the participants in order to establish that the researcher's and moderator's understanding was accurately interpretated.

Step 5: Debriefing between researcher and assistant moderator

- Debriefing occurred between the researcher and the assistant moderator immediately after each FGI in order to compare findings. First impressions and field notes taken by the assistant moderator and researcher were briefly discussed and verified. Any contrasts between focus groups with regards to experience and findings were also discussed.

Step 6: Distribution of findings

- This step involves the sharing of the findings of the study with all participants via publications and oral presentations which will occur on completion of this study.

3.11.1 DATA DISPLAY

In Chapter 4 the researcher describes and depicts each theme, sub-theme and coding that was identified in the data. Demographic data are tabulated. Direct quotes are used under each section to indicate how assumptions and conclusions were drawn from the participants' responses. In order to distinguish the quotes from the rest of the text a different font and line spacing was used.

3.11.2 SUMMARY OF COMPONENTS OF DATA ANALYSIS

The following diagram portrays the route of data analysis undertaken in this study.

1. Data Generation
Focus Group interviews
Sequencing of Questions

2. Data Reduction
Transcribing interviews

3. Data Display
Coding and themes

4. Verification and drawing conclusions
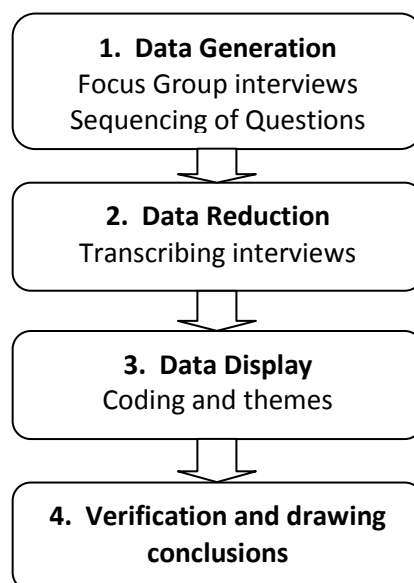
Figure 3.2: Data analysis process route (adapted from Miles and Huberman, 1994:10)

3.12 SUMMARY

An exploratory descriptive design, utilising a qualitative approach, was used in this study to elicit perceptions and experiences of registered professional nurses in the recognition of unexpected clinical deterioration in children nursed in paediatric wards. A purposive sampling technique was used to select twenty participants of the target population; however data was collected from seventeen participants as discussed above. Five focus group interviews were conducted to obtain data from participants. A pilot interview was conducted on the first focus group comprising four participants of the main study. Informed consent was obtained from all participants to take part in the study and for their responses to be recorded. All recorded data was transcribed by the researcher and, along with the field notes taken during the focus group interviews, was verified with the assistant moderator. The researcher conducted the data analysis and verified the coding with the assistant moderator who was the supervisor for the study.

An in depth description of the data analysis as well as the research results is discussed in Chapter 4.

CHAPTER 4

RESEARCH ANALYSIS AND RESULTS

4.1   INTRODUCTION

This chapter reviews and discusses the data analysis and research results of the qualitative data generated during the study. The data collected from five focus group interviews were transcribed verbatim from the audio recordings and analysed.

A schematic model adapted from Miles and Huberman (1994:92) shows the data analysis process utilised in this study and is presented below.
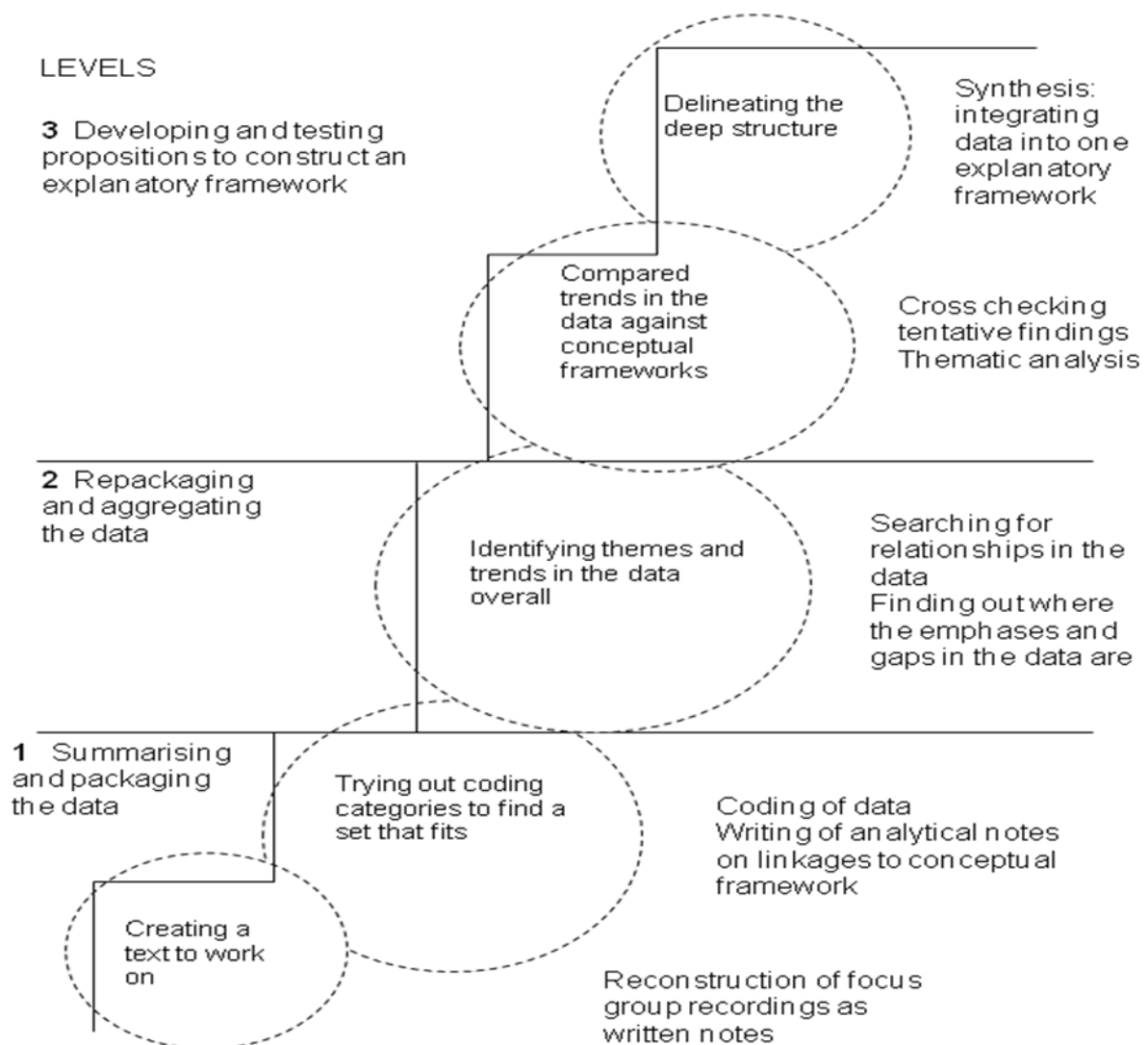
Figure 4.1: Data analysis process adapted from Miles and Huberman (1998:92)

Figure 4.1 shows the route of the data analysis process used in this study from level one to three as discussed below:

Level 1: Summarising and packaging the data

- Level 1 starts with the focus group interviews and data generation.
- This was followed by data reduction and the transcription of the focus group audio recordings.
- The raw data was then coded by linking the appropriate data into four major themes or higher-level concepts based on the research objectives.
- Each theme was then broken down into subthemes which linked and sorted the data into categories that were based on Donabedian's conceptual model of quality in health care (1966:166-206).

Level 2: Repackaging and aggregating the data

- The raw data was then scrutinised to identify lower-level concepts or similar ideas that emerged and abbreviations or codes were applied to the margins of the transcribed data.
- Related lower-level concepts or clusters were grouped together and it was determined whether they fitted into existing themes or whether new themes emerged.
- This helped the researcher to describe conceptually what themes were indicated by the data.

Level 3: Developing and testing propositions to construct an explanatory framework

- The final stage involved reducing the data for analysis of trends and cross-checking the tentative findings.
- This was followed by the verification and presentation of the findings, explicitly linked to the existing explanatory framework by Avedis Donabedian (1966:166-206).
- No new explanatory framework or theory was constructed from the data.

4.2   DATA PRESENTATION

The data is presented in three sections. Section A presents the demographic data of the participants that was elicited at the onset of each focus group interview. Section B presents the themes, sub-themes and clusters that emerged from the data through coding. Section C presents the interpretative findings and discussion of the data.

4.2.1   SECTION A: DEMOGRAPHIC DATA OF PARTICIPANTS

The demographic data showed that all the participants were female and their ages ranged between 20 and 60 years. The majority of participants were in the age range of 20-30 years and 40-50 years, respectively (see Figure 4.2).

Figure 4.3 shows the years of experience of the participants after a basic nursing qualification. All participants were registered with the South African Nursing Council (SANC, 2005:6) as professional nurses.   All the participants were permanently employed at the designated institution at the time of the focus group interviews. The majority of participants (n =6/35.2%) had more than 20 years of experience working in paediatrics.
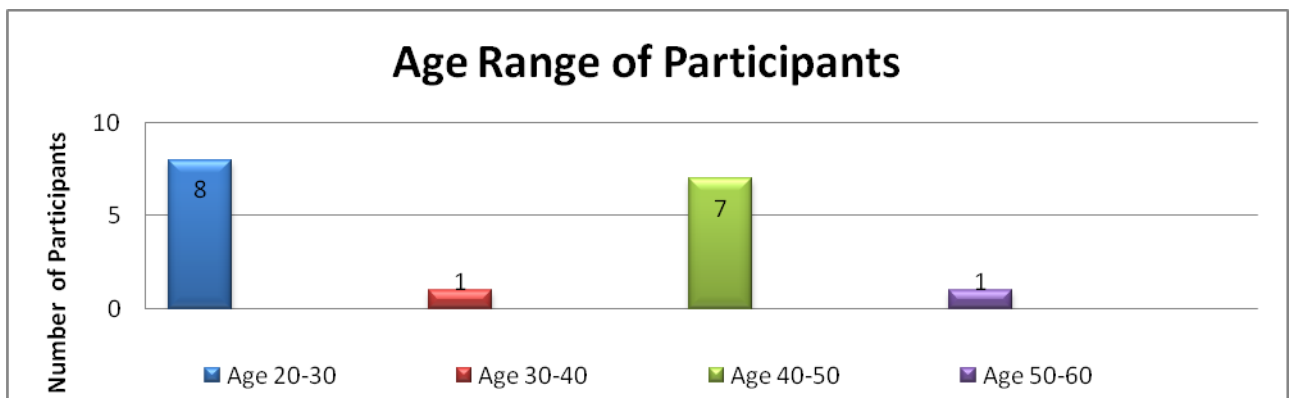
Figure 4.2: Participant Age Range

0-11 months	1-4 years	5-10 years	11-20 years	> 20 years
n=2(11.7%)	n=3(17.6%)	n=3(17.6%)	n=3(17.6%)	n=6(35.2%)
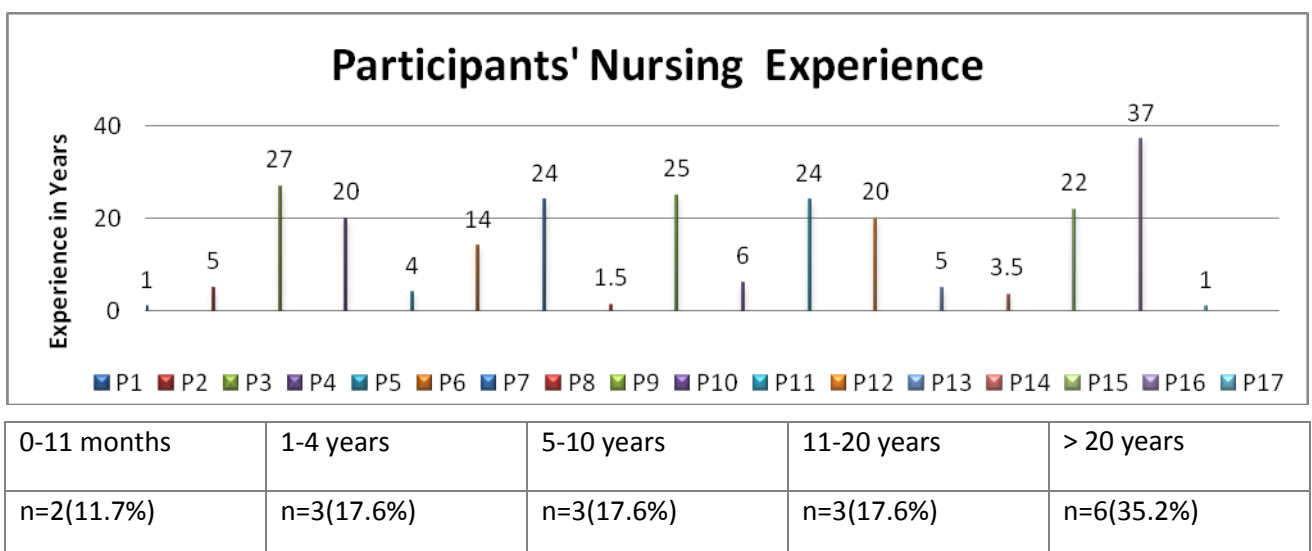
Figure 4.3: Years of Nursing experience in Paediatrics

The seventeen participants were working in various paediatric disciplines/wards, namely, oncology, surgical ward, medical ward, medical and surgical speciality wards, day surgical ward, and medical short stay ward (see Table 4.1). Of relevance to this study is the stipulation that they were all working in paediatric wards, and these wards also had high care units attached to them.

Table 4.1: Paediatric Wards where participants were located

Medical	Surgical	Oncology	Speciality	Day/Short stay
n=4(23.5%)	n=3(17.6%)	n=4(23.5%)	n=3(17.6%)	n=3(17.6%)

4.2.2   SECTION B: THEMES, SUB-THEMES AND CLUSTERS

4.2.2.1   THEMES

The data was categorised into four themes based on the study objectives. For the purpose of this study, a theme (or category) is defined as a higher-level concept representing a relevant phenomenon (Corbin & Strauss, 2008:159). This was the first level of coding.

4.2.2.2   SUB-THEMES

The data was then further categorised into three sub-themes, namely, 'structure', 'process of care', and 'quality assurance'. For the purpose of this study, sub-themes are defined as higher-level concepts which were identified by the researcher and based on and adapted from Avedis Donabedian's conceptual model of quality in health care (1966:166-206). Structure is defined as the environment or setting in which health care is provided (Donabedian, 1966:170), and process of care is defined as the method by which health care is provided (Donabedian, 1966:169). Quality assurance is defined as the planned, organised evaluation of the patient care which has been rendered (Booyens, 2001:213).   More specifically, it can be referred to 'the formal, systematic exercise of problem identification, designing activities to overcome the problems, taking follow-up steps to eliminate new problems and the implementation of corrective steps (Booyens, 2008:251).

These themes and sub-themes are depicted in Figures 4.4 below.

THEMES   **SUB-THEMES**

Structure

Positive Experiences
Regarding Recognition of
Clinical Deterioration

Process of Care

Quality Assurance

Structure

Negative Experiences
Regarding Recognition of
Clinical Deterioration

Process of Care

Quality Assurance

Structure

Challenges Pertaining to
Current Monitoring System

Process of Care

Quality Assurance

Structure

Training Factors Related to
Recognition of Clinical
Deterioration

Process of Care

Quality Assurance

Figure 4.4: Identified themes and sub-themes

4.2.2.3   IDENTIFIED CLUSTERS

Further coding involved exploring the raw data and extracting ideas or concepts and giving those ideas conceptual names (Corbin & Strauss, 2008:159-160). For the purpose of this study, related lower-level concepts grouped together were called clusters which were further categorised into sub-clusters. The next level of coding done was to link the clusters to the sub-themes and themes.

The result of this coding and categorising is firstly, a clear linking of the data provided by the FGI participants to a conceptual framework, and secondly, an identification of tangible recommendations for enhancing detection of clinical deterioration in children. Thus, conceptual and practical dimensions are linked together.

Each identified theme with its sub-themes, clusters and sub-clusters is tabulated in Tables 4.2 to 4.5 and will be discussed in detail in Section C.

4.2.3   SECTION C: INTERPRETATIVE FINDINGS AND DISCUSSION

4.2.3.1   THEME 1:   Positive Experiences Regarding Recognition of Clinical Deterioration

This was the first theme identified by the researcher. The data collected indicated the participants' personal positive experiences with regards to the recognition of clinical deterioration of children nursed in paediatric wards.

Table 4.2: Theme 1 and the identified clusters and sub-clusters.

Theme 1: Positive Experiences Regarding Recognition of Clinical Deterioration		
Sub-theme	**Cluster**	**Sub-cluster**
Structure	• Training	• Learning opportunities • Orientation • Mentoring • Basic Life Support
	• Professional motivation	• Career advancement
	• Personal motivation	• Intention to stay • Job satisfaction • Sense of belonging
Process of Care	• Observing and reporting	• Nursing staff • Parental involvement • Clinical rounds
	• Participation	• Teamwork • Communication
	• Interpretation of clinical signs and appropriate intervention	• Nursing staff actions • Frequency of observations • Doctors' intervention
	• Documentation of care	• Nursing care plans • Patient progress reports • Doctors' written orders
	• Intuition	• Nursing staff • Experience
	• Debriefing	• ICAS • Nursing staff • Management
Quality Assurance	• Evaluation of care	• Audits • Peer discussion • Feedback

4.2.3.1.1   Sub-theme 1: Structure

According to Avedis Donabedian (1966:170), Structure is described as the setting or environment in which the process of care takes place and the instrumentalities of which this process of care is the product. This may include the administrative and related processes that support and direct this process, for example, adequacy of facilities, qualifications of medical staff, administrative structure, and the operation of programmes that govern the process of care. Thus, the data provided by the participants was linked to their environment in which they provide health care.

As recorded above, the data was organised into clusters and sub-clusters and these are discussed below.

4.2.3.1.1.1   Cluster 1: Training

Pertaining to training, participants reported that the following learning opportunities contributed positively to their ability to detect signs of clinical deterioration in children.

Firstly, orientation programmes are in place for new nurses and are described by the participants as follows:

> "*They do include that topic in orientation" [made aware of what to do if a child's condition deteriorates]* **P4**

> "*When people go on orientation they get given basic 'red box' [resuscitation/code] orientation and how to nurse a sick child"* **P11**

> "*On orientation, the new appointments learn how to nurse a sick child and what to do if a child arrests/deteriorates so call procedure"* **P9**

Secondly, mentoring programmes, which are a form of training where longer-term nurses introduce newer nurses to the institution and teach specific tasks, are in place. These were described by the participants as follows:

> "*One of the things I also noticed when I first started and because I was new, they gave me a mentor for three months which I think it's good because you have a lot of things to learn and that I also likes about this hospital because every person that comes in the ward have a mentor for three months, at least, and that one that mentors must at least work for a year or longer. So I think that is one of the good things I like about this hospital"* **P5**

> "*I had to fill in, there is some 3 forms that I had to fill in in a year, there's some practical stuff in the wards that you must complete - yes [part of mentorship programme], for R/N's and for all the different categories of nursing staff"* **P9**

> "*The working environment, the staff, the operational management equipped me. They orientate you, they facilitate you for you to grow. I get my mentor in 2008, she was like, when I started, Ya, she was keeping me under her arm and showed me everything. For a year [had a mentor] because um, I was doing my community service to*" **P14**

Thirdly, formal in-service training as well as in-service organised by the staff of numerous departments is in place and is described by the participants as follows:

> *"Um, there is actually, ya, ya, if I had to that is actually the education roster for the year, this little one here with the different colours [pointing to an in-service training register on the wall]. So they do have um, staff nurse updates and nurses updates as well [talking about in-service training which includes topics on resuscitation and clinical deterioration]. It's inclusive, resus [resuscitation] training, or recognition of deterioration as in-service. I think it is once every month, so maybe one this month for staff nurses and maybe next month for the assistant nurses so" [talking about frequency of in-service training]* **P2**

> *"Like our in charge, she called us and then she like do some orientation around the emergency trolley, what is the first step you can take, when you can notice that the child is deteriorating"* **P8**

> "*So what we do in our ward, every Tuesday, we take from eleven till twelve or eleven thirty just an half hour we take this as a training session. The doctors sometimes come in and they give a lecture about some conditions of the patients in the ward"* **P9**

> *"We have, we also do in service training so there is a nurse and a registered nurse allocated for something. So like I have to like present maybe bowel washout, and the nurse has to do TPR [Temperature, Pulse, Respiration] and I think that also learns them about normal and abnormal vital signs"* **P5**

Fourthly, Basic Paediatric Life Support (BPLS) courses are offered by the hospital for nursing staff. Participants reported the following with regards to the course teaching them about recognition of clinical deterioration in children:

> *"I think it only taught us about resuscitation" [the BPLS course]* **P2**

> "*No, before you can resuscitate you get told what to look for, [as in how to recognise clinical deterioration]. Before you can say aah, resuscitate, there are things that you can look for and then call for help"* **P3**

> *"it is not only about resuscitation that they teach you on the course. But it was just how quickly you can respond and what you, what is your expectations and what would you see, what is the one that needs that support at that moment" [teach recognition of clinical deterioration]* **P6**

> *"Yes. [course assisted in being able to detect clinical deterioration in children]. You actually more alert also now"* **P16**

> *"Yes, they teach you how to recognise a deteriorating child"* [on the course]
> ***P14***

The above programmes that are in place are in line with the Policy on Quality in Health Care for South Africa (2007:15) where it states that "providing quality of care to patients requires the training of skilled health workers and establishing a culture of lifelong learning."

4.2.3.1.1.2   Cluster 2: Professional Motivation

As well as training opportunities, some participants reported that the hospital offered structured career advancement courses which would enable them to update their knowledge and skills:

> *"And they actually do have a high care course that they do send you on, I mean obviously not immediately once you get employed, but they do send you on a high care course, and then all the sisters have to go to the Basic Life Support Course as well. So there is stuff like that"* **P2**

> *"When I was doing paeds [Paediatric course] also, it was mentioned as well, things you can look for and call for help when a child deteriorates"* **P4**

> *"Another thing I was going to add also that is a positive thing, I came to [hospital name deleted], I trained here in my paediatrics, unlike in some hospitals you must work and wait 20 years to be upgraded, so at [hospital name deleted] they are upgrading us, they are improving our skills. Yes, I think I was here three years then did Paediatrics."* **P10**

As professional competencies directly impact on the quality of care being provided to patients, continuing professional development is required in terms of applicable legislation in South Africa (National Department of Health, A policy on quality in health care in South Africa, 2007:16).

4.2.3.1.1.3   Cluster 3: Personal motivation

Participants reported their sense of belonging, job satisfaction and ultimately their intention to stay in their profession and current place of work. These factors inspired some of the participants to provide quality patient care which included attention to clinical deterioration:

> *"My experience in working with children you know, I think it starts from the fact that I love children and the way I love children, and then that love it evolved to the work that I'm doing as a Paediatric Nurse. And then I had so*

many experiences you know, different families, different problems, you know, and that interaction with the whole family you know, it it makes you in a way to feel to have fulfilment of what you are doing. Because apart from looking at this problem that this child is presenting with, you are able to look at a background so that is where you, you try to, to sort out the problem you know as part, you become part also of that family, and that also gives you, you know an edge to go deeper in helping that particular individual. Because at some stage you take yourself out and put him in the shoes of that family and then you let yourself feel that and then in a way that made me, you know, to to cling on nursing, you know not to divert and also to be more interested on the hands on part [of nursing] because when you are on hands on, you are able to deal with all this things rather than the books" **P7**

"*It was a good environment for me to work at [hospital name deleted]. Well I prefer children to adults because um maybe, I have a passion in children. In nursing children, it's much easier. I think it's easier*" **P13**

"*So when I came here the first thing I did notice, it it tooks a little bit longer with babies. But you get so used to it that you can't even think now to go to an adult ward, because you use to, you know, you must observe everything, you must observe and that I notices you must observe. If you done something you must come back and check on them [the children] and that is one of the first things that I notice and that's why I stayed still there. Like the job satisfaction*" [working with children and at hospital] **P5**

"*Yes, yes it is like having your own family. You are leaving you own family at home and you coming to another family, it's really. And you are actually looking forward to work if you at home. At [hospital name deleted] I don't think I want to go somewhere else again*" [Intent to stay, valued, belonging] **P6**

"*You need someone else, but there on the ground if you see, ok, this child I think is deteriorating and my observations are telling me this, maybe this is this thing [reason], then you can call the doctor. I'm observing this, what about this, what about that thing. It also helps you to boost your morale because at the end of the day, once you see that child, you know, progressing nicely and then you gonna give yourself a pat, ooh I done a good job. More especially if your observations were accurate*" **P2**

As one study showed (Ernst, Franco, Messmer & Gonzalez, 2004:4), job satisfaction positively impacts on nurses' intention to stay and the quality of patient care provided in a paediatric setting.

4.2.3.1.2   Sub-theme 2: Process of Care

According to Avedis Donabedian (1966:169), Process of Care is the method by which health care is provided. This includes but is not exclusive to the co-ordination, continuity and

acceptability of the care rendered based on standards of care. Thus, the data provided by the participants was linked to their experiences regarding the method by which they provide health care.

Under the sub-theme Process of Care, the following clusters and sub-clusters were identified and are discussed below.

4.2.3.1.2.1   Cluster 1: Observing and Reporting

Under the cluster, observing and reporting, participants stated that both nurses and parents are involved with the observing and reporting of clinical deterioration of children nursed in paediatric wards. This is reflected by the following participant statements:

> *"By looking at the child you can see there's a decrease in condition, besides observation and the baseline [observations/vital signs]. On admission they have a baseline [observations/vital signs] and you can see if there is improvement or deterioration. Um, so with the observations and all that you can objectively see that this child is not looking well. The mom will tell you as well"* ***P1***

> *"The nurses that are around, also parents and also the condition of a child from arrival and from now helps you recognise clinical deterioration"* ***P4***

> *"....nurses are taught how to recognise the signs if there is a problem, or the mother complains to the nurses. That's the most important go between, communication between the mother and the nurse"* ***P12***

> *"You know, it's actually better now with the mothers sitting next to their own children all the time, they really a help [the mothers]"* ***P16***

Along with nurse and parental involvement, participants also indicated that the carrying out of clinical rounds in the wards at least once a day was beneficial in raising staff awareness of children in their care.

> *"....nurses report when there is a problem. That's why we have regular update meetings with them about the kids with them. Whatever abnormality, they must report it immediately. We do it in the morning, the one o'clock round and the evening handover round. So, so nurses that are allocated at the day must hand over at the bedside. We go from bed to bed"* ***P6***

"...that also helps because you go on a pm round the whole staff. Then everybody must hand over. So then you also check up did the child pass urine, the temperature spiked, so all this things we have to hand over" **P5**

4.2.3.1.2.2   Cluster 2: Participation

Participants described teamwork and clear communication between staff, doctors and management as essential components of detection of clinical deterioration in children. This was indicated as follows:

"*I will say that from the patient's side, we see the patients come in, they are very sick, then you see they are progressing very well because of our teamwork, like with our doctors also, we are working very well with our doctors..."* **P10**

"I am proud to be part of [hospital name deleted] and to feel part of the team, and the management communicates very well. I must say the messages; before something changes we hear about it, it is discussed with us so we feel part of decision making and very much in the picture" **P11**

"I think that's teamwork, when we are short staffed and a child is deteriorating in the wards. Teamwork, that's where if you have competent nurses that are part of the team, they can come and report that, this child is not looking as it should be or so" **P12**

"*I would also say communication between you and your nurse is important because if your junior comes and reports and say sister, this child doesn't look well to me today, you must act on that and take her word for that, she will never be worried for nothing because she knows how her patient looked yesterday and how her patients looks today"* **P9**

"We work well together, communication as well plays a big role in terms of team work" **P13**

4.2.3.1.2.3   Cluster 3: Interpretation of clinical signs and appropriate intervention

Participants stated that the procedure nursing staff followed when a child was deteriorating clinically was to report abnormal observations/vital signs, increase the frequency of the observations, and call the Doctor.

"I think you need to focus on your basic nursing care, to recognise clinical deterioration. You do observations, or sometimes you get called, Sister this child, I'm not happy with this child" **P3**

"If a child is deteriorating, we increase observations [frequency], and then because there is always a doctor, your also ask the doctor, please doctor I'm not happy about this child, please review this child. And then if there is a need for ICU, sometimes the ICU then they usually take a better child and then they make a swop" [make space in ICU by sending a child out who is in a more stable condition] **P4**

"...I haven't seen a protocol regarding that, but what I've observed is that when the condition of the child is deteriorating, they [nursing staff] call the doctor to come and review the patient, and after that, the patient is placed in high care or sometimes we, we prepare to shift because sometimes, the high care is full already and we see this child is going to need to go to high care, we make arrangements. The frequency of observations it is changed by the nurses already, because even the nurses are aware if that BP was like that [abnormal] it means I have to go do checking after every 30 minutes" **P7**

"If your child is on the floor [in a bed in the ward], then you must make a space so you can move that child to high care so that you can observe the child more closely, specially sometimes you find the child is on the floor [in a bed in the ward], there is no mother with the child. In the high care there is a nurse every minute so she can see, so that child must be more observed now because he has deteriorated, so we bring them forward to the high care in the cubicle, so he must be brought forward in the high care" **P9**

4.2.3.1.2.4   Cluster 4: Documentation of Care

Documentation of care involves the documenting of nursing care plans, the patient progress reports, the vital signs charts and the Doctor's written orders specifically. Participants stated that these documents assist nurses with a record and prescription that can be referred to when a child's condition is deteriorating or has deteriorated:

"I notice that each and every one is appreciated because our input as a RN is appreciated, for instance we have to make sure that that child have a proper care plan, nursing care plan. Which we start with like we, we, stick on that, we stick on that because if the patient does not have a nursing care plan which means what you are, what your expectations will be like, but what are our income [results of plan] looks like because we need to see our income [results of plan] at the end of the day, what our expectations" [whether expectations have been met] **P8**

"....According to what the prescription says [frequency of observations/vital signs]. Some doctors want it three hourly, 4 hourly, you understand, so we go according to what is prescribed [observations], according to what the doctor wants. And the thing is this, you also do observations when you see there is something wrong with the child, in between [observation times] but

you go and you just check. And you just go and, that's in between, and you just you make a recording an entry [in the patient progress report] and you speak to doctor about this patient" **P6**

"In my ward it is written, like we took the orders from the doctors for instance, they say, if the temperature on this patient is above 38, they [the staff] must do this and this, they [the staff] must act on this" **P8**

"It's very much the same in our ward, we also increase frequency of observations [when a child's condition deteriorates], but you have to document everything" **P5**

"...especially with a Cardiac [child with a heart condition], doctor please write there what is an accepted range of the sats [oxygen saturation], vitals" [for staff to know parameters for a specific child] **P3**

" Like by us the doctor will say, if the patient have got a temperature of 38 or 38.5 or 37 then we write it on the board. [Doctor's orders written on a white board at patient's bedside]. Then the doctor say, then we must do blood culture FBC and start on antibiotics. So the nurses know they will check the board [for parameters written on the whiteboard], so if the child's got a temperature then they report it to us" **P16**

"...in my unit as well, like if they [the Doctors] want the blood pressure to be this much then we just write it on the blood pressure chart. We want limits of this much, doctor wants a systolic of 100mHg, they just write systolic not less than 100mmHg. Such as when you do your ward round, you've got your book which you write your doctor's orders, and then for each patient you write the instructions" **P13**

4.2.3.1.2.5   Cluster 5: Intuition

Under the cluster intuition, participants reported that nursing staff often recognise intuitively that a child's condition is deteriorating with no actual clinical evidence. Action is then taken to report this and observe the child more closely. Intuition often comes with experience:

"...and sometimes there is a gut [feeling] that is telling you, hey, there is something that is not right here. Yeah and then you do the observations, sometimes still there is nothing that is telling you [the observations are normal]. It is then now that you tell the doctor, listen, I'm not happy about this child. I don't know what it is but something tells me there's something wrong" **P8**

"Ja, it's also like the child – you look at the child and you see, hey, that the child was not like this, and the child suddenly look like this. They say mos [just] you must use your akkel, your initiative" **P6**

"...there is always somebody that can be moved over [to a High Care cubicle] but if high care is full, the doctors must actually or you must bring or the nurses must actually bring him [the patient] closer to the nurses' station" [in the ward for closer observation] **P9**

4.2.3.1.2.6   Cluster 6: Debriefing

Under the cluster debriefing, participants reported that there are formal and informal processes in place for staff to receive emotional/trauma debriefing following distressing or adverse events such as the death of a patient. The benefits of such an opportunity are to assist staff to come to terms with the loss of a child, to ensure it does not hinder their ability to face similar situations, and to help restore their confidence in their own ability.   The following quotations from participants depict this:

"The chaplain came to speak to us once, after we had a death in our ward, so yes there is, um, are resources available. And we do sometimes use ICAS [Independent Counselling and Advisory Services], we are encouraged to use ICAS. Ya, all staff are aware of ICAS" **P2**

"...as soon as you report that there's been a death in the ward, the management says to the sister in charge, have you arranged debriefing for the staff that were involved. I've never experienced the way here, we had a death in one of the wards here um, immediately there were staff that were taken from the other wards to help in the ward, doing our duties, because we were so shaken by the death. They'll call for this ICAS and they was also a minister, they did a good job. Even the Matron was also here, they gave us such a good support. Yes it depends on each individual on how you take it because a death of a child, you think of your own child and it, it works on you as an individual. It is unique how you respond to that case, but the hospital is trying their best because for me it was the first time that I saw it" **P4**

"...any problem that you come through there is ICAS, there is a lot of support systems also in the hospital for the staff, for the family members of the patients, and the patients. So we got ICAS that is a support system for the nursing staff, for the health professionals. ICAS come and then they have this counselling sessions with the nurses, because you know it's very, it's very emotional, so they, they actually sitting and talking to these nurses and have these counselling sessions and you can speak what is on your mind. And then the social workers that they have here for the family. Support of the parents and the patients, they sort of very good, they support the family with those who struggle with food etc, and that is also very nice of this hospital" **P6**

"Our in charge [unit manager] arranges debriefing for the staff with ICAS" **P16**

4.2.3.1.3   Sub-theme 3: Quality Assurance

According to Avedis Donabedian (1966:167), the "quality of care" is "difficult to define as the assessment of quality rests on a conceptual and operationalised definition of what the 'quality of medical care' means." Thus, for the purpose of this study, rather than assessing the quality of the care provided, the researcher looked at the participants' comments and experiences with regards to "Quality assurance processes" that may have been in place.

Quality assurance is defined as the planned, organised evaluation of the patient care which has been rendered in the organisation (Booyens, 2001:213). This may be the evaluation of the care rendered through auditing and peer discussions, as well as the communication of results through feedback sessions to staff and Morbidity and Mortality (M&M) meetings.

Under the sub-theme Quality Assurance, the following clusters and sub-clusters were identified and are discussed below.

4.2.3.1.3.1   Cluster 1: Evaluation of care

Under the cluster evaluation of care, participants described that it was helpful to conduct peer discussions and receive feedback after a child's condition had deteriorated. They also reported that the carrying out of a hospital audit was beneficial for ensuring adherence to policies and procedures:

> *"...when you come back to work, if you discover that, ok, maybe if we did that earlier [discussion regarding an adverse event], then it, binds you as a team now. Because what I normally do, I used to come and say 'guys, I am not happy because I think A, B, C and D is the cause of that deterioration, meaning that we need to be more vigilant in a way'. It is also helping with building up the team because when you sit down and put the thing on the table [discussion regarding a child who has deteriorated] and each one comes in. Then even if I wasn't the one [who was involved], but one of the team could have done something that she didn't do, it evokes another thought in her [makes the staff member think about a situation], so in a way there will be an upliftment of standards" [peer discussions, positive support and feedback] P7*

> *"We were audited recently...the matron from another hospital and our matron came to our ward. Basically they came and assessed um the charts of post operative patients and patients that received blood, those that had blood transfusions, and they were just basically checking up on the on the doctors as well as the nursing staff, to see if we just follow the protocols" P2*

4.2.3.2 **THEME 2:** **Negative Experiences Regarding Recognition of Clinical Deterioration**

This was the second theme identified by the researcher. The data collected indicated the participants' personal negative experiences with regards to the recognition of clinical deterioration of children nursed in paediatric wards.

Table 4.3: Theme 2 and the identified clusters and sub-clusters.

Theme 2: Negative Experiences Regarding Recognition of Clinical Deterioration		
Sub-theme	**Cluster**	**Sub-cluster**
Structure	• Acuities	• Sicker children • Disease profile in SA • Social issues • Workload on staff • Risk increased
	• Adequacy of facilities	• Lack of ICU beds • Number of beds per ward • Adjusted guidelines
	• Staff ratios	• Shortage of staff • Absenteeism • Night cover
	• Knowledge gap	• Inexperienced staff • ICU technology
	• Equipment	• Shortage • Servicing of equipment
	• Emotional cost	• Loss of a child • Burnout
	• Administrative support	• Clerical
Process of Care Process of Care (continued)	• Observing and reporting	• Setting • Parents involved • Doctor cover • Students • Staff cover
	• Parental involvement	• Unplug devices
	• Emergency interventions	• Number per month
Quality Assurance	• Evaluation of care	• Peer discussion • Feedback

4.2.3.2.1   Sub-theme 1: Structure

Based on Avedis Donabedian's description of Structure (1966:170) as discussed previously, the data provided by the participants was linked to their environment in which they provide health care.

As above, the data was again organised into clusters and sub-clusters and these are discussed below.

4.2.3.2.1.1   Cluster 1: Acuities

The online free medical dictionary (2012) defines "patient acuity" as "the level of severity of an illness."   It goes on to say that "this is one of the parameters considered in patient classification systems that are designed to serve as guidelines for the allocation of nursing staff, to justify staffing decisions, and to aid in long-range projection of staffing and budget."

Under the cluster acuities, numerous participants expressed their concerns in being able to identify clinical deterioration in children due to the increased level of severity of illness of children that they are nursing in paediatric wards and thus an increased workload. They expressed that the increased acuities could be due to firstly, the disease profile in South Africa, namely, Tuberculosis (TB), Human Immunodeficiency Virus (HIV) and malnutrition, and secondly social issues in the community. Participants also expressed that nursing sicker patients in the wards resulted in an increased workload on the staff; in addition they reported that the risk of failure to recognise clinical deterioration in children in their care was increased. The following quotations from the participants depict this:

> *"...Especially in our wards, we admit a lot of patients, coming in with shocked gastro [gastroenteritis], kwashies [kwashiorkor], you know marasies [marasmic] and these days it's like the pneumonias and that. The worst of all is the gastros and the kwashies. They are underfed children, undernourished children, When they come in they look like children that has been burned, that is the kwashies, kwashiorkors, so we have sicker children in the wards"* **P6**

> *"...we are finding sicker patients coming into the hospital as a result of these disease profiles, because of HIV, TB, malnutrition,..."* **P16 and P17**

> *"...I think sicker children in wards puts strain on the nurses because they come to the hospital, the mom expects the child to walk out of the hospital and expects them to be looked after as a normal child, then the child get*

sicker and sicker, even in the surgical ward. The surgical children they normally go quickly home but because of HIV and TB, it's stretching. The child now stays longer in hospital" **P12**

"Social issues is another reason for children being sicker in the wards in hospitals..." **P7**

"....and this malnutrition is a social issue, but most the families that is drinking, that doesn't take care of the children. They get these grants [from government] which they use up and they don't feed children or they just leave the children with other people or they forget to come home. This is all this [the situation]. I'm telling you we are social workers also. We are everything" **P6**

"...talking about general why we think the children are sicker, I would say, I don't know what is happening back in the communities there, because what I noticed in my ward, we've got some patients they would be discharged well and then, within two weeks they are back worse. So we don't actually know what is happening in the community" **P10**

"I worked in a medical ward, the mothers come back to us, they get a certain number at the day hospital [clinic] and they sit there from 5 o' clock in the morning and are going home at 11 o' clock not being seen by a doctor. Eventually when they get here [to the hospital], the patient is nearly half dead or dead on arrival because of sitting in queues and not being helped at the clinics" **P12**

"*...we still have many children who are HIV positive and that, that is a major factor in their health status because that impacts on their growth and development and so yes, because they are HIV positive, they have all these opportunistic infections that have to be nursed in hospital because they too sick to go to a secondary or first level of care facility, so they come here because they are so sick. And because often, they have these chronic conditions because of their HIV status, so they come back and back and back. They get discharged, they come back, they get discharged, and they come back. So yes, they are sick, they are sicker because of that, because of their immune factor, and also many of our children coming to [hospital name deleted], they come from informal settlements. So, already that's a challenge. So socially they are really challenged, nutritionally they are challenged, and that plays havoc with their whole systems. So they come here and they are quite sick, so yes, we tend to sicker children especially in the wards. Look, it impacts greatly on the work load of the nurses working in the wards and I don't think we've looked at it, you researchers you need to look at it. We haven't looked at the workload attached to nursing a child as opposed to an adult. In an adult hospital you can do with fewer nurses than what you can in a paediatric setting, and so I think those kind of values need to be worked on, how much time does it take for me to nurse a sick child in the ward"* **P15**

"When the, when the ward is full, then you are really busy, then it is difficult for you to notice clinical deterioration in a child" **P17**

4.2.3.2.1.2   Cluster 2: Adequacy of facilities

Under the cluster adequacy of facilities, participants expressed that the lack of ICU (Intensive Care Unit) beds contributed greatly to the fact that sicker patients were being nursed in paediatric wards by nursing staff who were not adequately equipped to do so.

"...from my personal experience, when I worked in the ward and we needed patients to be in high care for example, if there weren't beds available, so because of that we couldn't exactly throw them out [the patients], we just had to cope with that child that needed to be either in ICU or in High care" **P1**

"I think my experience is the same as theirs, so it's also the thing of beds not being available [ICU beds]. Many a times you get the shortage of nurses so now we've got so many patients, so looking after those number of patients now we ended up now nursing those patients in the areas which are not suitable" **P3**

"...in the wards you will see children that are actually qualifies to be ICU patients, but then they have to be nursed in the High Care unit in the ward. I mean, because sometimes children that are supposed to be ventilated sometimes wait in the ward because there is no space in the ICU. Then you have to nurse that child on a CPAP or on a mobile ventilator in the High Care ward until ICU has got a space for you" **P9**

"...we nurse the child until they [ICU] are ready. We get no extra help from ICU while waiting for an ICU bed" **P16**

"...we only have twenty beds in our ICU for the entire hospital. And twenty beds is, if you think of the Western Cape [population], twenty beds is nothing. And so yes, we are seeing sicker children being nursed in our wards and in our high care cubicles because we don't always have an ICU bed, so the child has to stay in the ward to be nursed there" **P15**

Under the cluster adequacy of facilities, participants also expressed concerns related to the increased number of occupied beds per ward, which exacerbates staff shortages and lack of equipment. These impacts negatively on optimal patient care. A quotation below from one participant depicts this clearly:

"...when we go over our bed totals, there will be help but not the equivalent, there would maybe be a nurse to 30 patients for example, which is impossible. Now at that time we are having a shortage, um, there's a limit of staff, there isn't any bed availability [elsewhere], the equipment isn't enough. Realistically, if you have a ward with so many children, how could you do that child's observations see to everything the child needs?   With

equipment, maybe the child needs phototherapy, we don't have that, so we have to run from ward to ward to ward to see please isn't there phototherapy lights available for us?" **P1**

One participant also noted that as guidelines have been adjusted to accommodate certain children in wards as opposed to an ICU, they have to observe these children more closely.

"I notice that now we must take children with abnormal weights [in the ward]. We had a certain weight that we accepted before otherwise they must go to ICU but now we have to accept that patients even though they are like 1.7kg. Because they are small, I think we are skilled enough to look after children with lower weights, the children are only smaller, only because they are so small you have to like observe that children very closely. They can deteriorate faster that I think, I think because of the weight they can deteriorate" **P5**

4.2.3.2.1.3   Cluster 3: Staff ratios

Under the cluster staff ratios, participants reported that general staff shortages as well as staff shortages related to absenteeism would make it more difficult for them to be able to detect clinical deterioration in children nursed in the wards. Participants also reported that the shortage of staff was more of a problem on night duty.

"The number one thing that would make it difficult to recognise clinical deterioration in a child would be the shortage of staff, because you cannot be all over. Maybe you are doing something, or sedating a child, another child there goes down, the condition goes down, and sometimes you are not there, and maybe most of the children in your ward are very sick, all of them. I'm thinking also, if there is a shortage of nurses, the ones that keep on coming [on duty], at some stage or another, they become sick, they become tired and they, there is a lot of absenteeism" **P4**

"Our bed allocation is twenty eight but sometimes they go up to thirty two, we don't have enough staff to look after 30 patients. We haven't enough staff, there is always, because the thing is this; staff don't always come on duty, they call in sick. Sometimes you get agency staff to help, but at day actually, not at night. Sometimes they might send you a nurse and sometimes the staff they work overtime" **P6**

"...we are just getting more and more patients than we used to, we needed to put more beds in cubicles that were mainly used for moms, we have over 20 patients quite often, and it's not always an ideal staff situation. So the workload is getting heavier, the patients do seem to be sicker if I look back to when I started here. But our medical team is good. That is my experience" **P11**

"There's always five patients in our high care [attached to the ward]. Nowadays, patients on CPAP [Continuous Positive Airway Pressure machines] are mainly nursed in high care areas in wards and no longer in ICU. So we have to take CPAPs, but like I said, we are normally only allowed two CPAPs in our ward. During the day in our high care, we normally put a staff nurse and a nurse, or a sister and a nurse according to the patient's acuity and according to the staff we have in the ward. So at night, there's not always a staff nurse for the high care. So there is basically two nurses in the high care and then one sister on the floor at night. At night it's actually more risky then because there is also less doctors and then there is less staff, so that is more risky at night" **P6**

"I think really, if we can have more, enough staff, then we can give proper nursing care to our patients. Then we can be able to assess and notice everything that is happening to our patients" **P17**

4.2.3.2.1.4   Cluster 4: Knowledge gap

Participants reported that often the lack of ICU beds resulted in them having to nurse critically ill children in the wards. Participants felt that they often lacked the experience and training necessary to nurse these children, especially those children nursed with ICU technology, for example, CPAP machines and ventilators.

"...so it's also the thing of beds not being available [ICU beds]. Many a times we ended up now nursing those patients in the areas which are not suitable. Cause that is not your specialty, you are not able to give the children the care they require due to a shortage of staff and shortage of ICU beds. You know we can work in this hospital, and then you find that there are paediatric trained staff and then there are ICU trained staff. So now you are in a paediatric situation nursing an ICU patient. Imagine, I don't know when last I was in ICU and there I find myself in front of a critically ill child, OK, I also feel if it's me, I'll have to do what I have to but at the end of the day I don't have that specialty" **P3**

"There were two cases where they had to ventilate the child in our ward. So that child was on ventilation for three hours in the ward before they could make space for that child in ICU. We have to nurse them, ICU trained staff are not sent to the ward to look after ventilated/CPAP patient's while waiting for an ICU bed" **P6**

"We are not trained to look after ICU patients, but recently they [the hospital] gave the staff in some areas in-service training on CPAP [Continuous Positive Airway Pressure machines] because the load was so much and sometimes you have two CPAPs in your ward in the High Care. So this was why they saw the significance to come to give in-service to the nurses in high care. In our ward we were not given any formal training on CPAP, we are taught by other staff in the wards, like with me, I will teach the community service sisters who have just come to the ward" **P10**

"...it is not the acceptances that even those who are working in the wards they are query trained enough now to look after children on CPAP in the wards" **P7**

4.2.3.2.1.5   Cluster 5: Equipment

Under the cluster equipment, participants expressed concerns related to the shortages, availability and servicing or calibration of equipment. As a result, participants felt that they were not able to care for the child adequately under these circumstances. Quotations below from participants depict this:

"...ok the nursing shortage, and you see what you are lacking in your ward is like more equipment, [what you need is nurses and more equipment]. And also you sit here and your equipment gets ah, what is this Biomed thing [servicing]? Because you can have equipment as much as you have but if the equipment is not serviced it is a problem. So, on the premises we need servicing and calibrating [of equipment]. And your equipment must have stickers that indicates this machine must go for a service so whoever walks past can see it" [a recommendation] **P3**

"We don't have the same equipment as compared to ICUs. This is a problem of nursing sicker patients in the wards instead of in an ICU" **P8**

"In the high care in the wards they got this cardiac monitors, where you can attach the BP [blood pressure] and the SATS [oxygen saturation monitoring], they have inserted new monitors on our high care side now to observe the child, so we don't need extra in there. So now when they putting the child on the ventilator, they bring the ventilator down and CPAPs we also have to go fetch in ICU, we don't have it in our ward. We go fetch it in the ICUs". In the ward, not in the High Care, we need like more SATS [oxygen saturation monitoring] and more BP [blood pressure] monitors because you have to take the SATS monitor from that one patient to another patient" **P6**

"...we don't have enough equipment, because with the sicker children we need more monitors like SATS monitors and ECG monitors..." **P9**

4.2.3.2.1.6   Cluster 6: Emotional cost

Under the cluster emotional cost, participants expressed their emotional involvement when nursing children and, in particular, the impact of the death of a child on the staff involved. One participant also commented on reflecting on what went wrong when a child died:

"But sometimes, you know, you don't really come to a closure and more especially if a child dies, I because ah, I become so attached to the children..."P4

"...you see them grow up, that is the hardest part of being in a paediatric hospital, but seeing that small young child go [die] you say my God, that was still a whole life around and that child is now gone. But now you get so attached to the parents and the children. And whether you are a parent or not, you get emotionally involved because I say if your heart is in nursing you feel this. So you see the children die, that is only the hardest part of this, seeing them die, and then you so in connection with the parents, you go see if they coping, if they ok, just to give her a listening ear" P6

"...and then it becomes bad only when you lose that child. And most of the time you sit, I for instance, that's the experience like I'm used to. Like when I'm home I'm gonna think, ok, is there anything we did wrong with that child? Ok let me think, ok, we've missed doing that you know, and then it's the doctor, was that doctor competent enough? So those are the questions that come and play in your mind, and then when you come back to work, if you discuss that, ok, maybe if we did that earlier then it, it binds you as a team" P7

4.2.3.2.1.7   Cluster 7:   Administrative support

Participants expressed that the lack of clerical support, especially at night, was a problem as they were spending time on administrative duties rather than on nursing duties.   The following quotations express this:

"I would put in more clerical assistance.   Because often, because often nurses we are doing, we are spending so much time on clerical things.   You are sitting on the telephone ok, sometimes you have to speak to another person, but someone else can order that machine, someone else can phone to find out whatever about that machine.   You know, that kind of thing..." P15

"...it's a problem, sometimes you know, its night duty.   Then you and a nurse are maybe alone, sometimes you are alone as a sister and then that phone rings, and they only give you two nurses, and if that nurses are on a break, and then you the sister are alone.   Now you are busy with something at the back, with your IV's [intravenous fluids], and then the phone rings it's taking you away from nursing" P16

4.2.3.2.2   Sub-theme 2: Process of Care

As discussed earlier, according to Avedis Donabedian (1966:169), Process of Care is the method by which health care is provided. Thus, the data provided by the participants was linked to their negative experiences regarding the method by which they provide health care.

Under the sub-theme Process of Care, the following clusters and sub-clusters were identified and are discussed below.

4.2.3.2.2.1   Cluster 1: Observing and Reporting

Under the cluster, observing and reporting, participants stated that it was sometimes difficult to observe clinical deterioration given the setting in which they provide their health care.

> *"...firstly, you are being required to care for a patient that is out of your level of ability, there's a, there's limit of staff, there isn't any bed availability, the equipment isn't enough, realistically, if you have a ward with so many children, how could you do that child's observations, and see to everything the child needs..." **P1***

> *"...that's by using your senses, your eyes, your ears, how to notice clinical deterioration in a child, it's a challenge if there are not enough staff" **P3***

Participants also expressed the need for parental involvement to assist them to observe their children and report if something is wrong.

> *"We wouldn't cope without the mother, that is why in those wards a mother is a must and you know, when you speak with them, I just tell them, I like to make an example to the mothers, would you please stay with your child because this ward is like a station, Cape Town station, all the trains come in and you wait for your train, that train that you are going to board is only the next morning when the doctors come and it's like, it's like a Casualty Ward or Emergency Ward' [very busy ward] **P3***

> *"Yes nurses are taught how to recognise the signs if there is a problem, or the mother complains to the nurses. That's the most important go between, communication between the mother and the nurse" **P12***

> *"You know, it's actually better now with the mothers sitting next to their own children all the time, they really are a help" **P16***

It was also noted by participants that due to limited doctor cover at night, reporting and managing of clinical deterioration is more difficult. This is reflected by the following combined participant statements

> *"When a child deteriorates and then because there is always a doctor, you also ask the doctor, please doctor I'm not happy about this child, please review this child.* **P4** *"At night it's a bit difficult as the doctor's are not in the ward all the time"* **P2** *"Because the time I worked night duty, there would be one SHO [senior house officer], and one intern for all those patients including running the Medical Emergency ward. But I mean, with the totals of patients, consultants are on call, but what I am trying to say is they are not in the building at night so it can be quite hectic"* **P1**

One participant has also observed that the reporting of problems is sometimes missed by new students in the wards and is therefore only picked up later:

> *"It's actually just the students sometimes, you know, every time we are getting new students and um, now it is time for handover [to a different shift], then they [the students] have gone off duty. Then you see that child has got a temperature, now you must still take the bloods and that [corrective action as abnormalities not always reported by students]. We have to orientate them [the students], but I mean, sometimes we also very busy. That is actually a problem with all the students, but I mean they are a help, they really help..."* **P16**

Participants also noted that with limited staff cover during lunch and tea breaks, they had to make a plan in order to be able to observe the condition of the children in their care:

> *"If they are sick we have them on a cardiac monitor and a SATS monitor [oxygen saturation monitor]. The problem with us, maybe of the three nurses, if two of them go to lunch, obviously then there is nobody physically in the high care ward at the time, then we just pop in and out, in and out, but obviously when a child is very unstable you are going to try and be there as much as possible"* **P11**

4.2.3.2.2.2   Cluster 2: Parental involvement

Although participants expressed the need for parental involvement to assist them to observe their children and report if something is wrong, some participants noted an increased risk of having the parents too closely involved:

> *"Sometimes the parents take out the plugs [of the monitoring or infusion devices] to charge their cell phones on those emergency plugs. So we*

have to watch them. Look, the monitors work on batteries but you still don't want them [the parents] to do this" **P11**

"Some of the other mothers that have stayed here too long, they know some of the machines. Like if sometimes if you are giving an antibiotic and the machine [infusion pump] will say "End", but you are not there at that time, they [the mothers] will switch the machine off, they will come back and say what they have done..." **P10**

"...the Sats [oxygen saturation] monitor also sometimes, I don't know if the Sats [oxygen saturation] monitor works on their nerves or what, they [the parents] switch off the monitor, and I will come and say 'mommy please, we need to see what is happening to your child if that monitor goes off, do not switch it off..." **P12**

4.2.3.2.2.3   Cluster 3: Emergency interventions

Under the cluster, emergency interventions, participants commented on the number of emergency interventions or resuscitations they were seeing in some of the wards as a result of the children being sicker:

"...It also depends on the patient's condition [amount of emergency's they are experiencing a month], some patients are transferred to the wards from ICU and then the consultant or the registrar gives a 'not for active resuscitation order' because of their condition. We still give basic nursing care. So in surgical not often, maybe one or two a month [number of resuscitations]..." **P12**

"...seen a couple a couple of months ago, and then nothing since. [how often the resuscitations happen in the wards]. Sometimes we can see things and we are concerned about a patient, but the doctor knows the patient is just borderline and he is just watching the child, and then as you say, something can happen very quickly" **P11**

"It happens quite often, not every month, but it has happened so twice or thrice a month before [number of resuscitations]. Now they are smaller and they are sicker that's why we are seeing one or two resuscitations a month" **P9**

4.2.3.2.3   Sub-theme 3: Quality Assurance

As discussed previously, for the purpose of this study, rather than assessing the quality of the care provided, the researcher looked at the participants' comments and experiences with regards to "Quality assurance processes" that may have been in place.

This may be the evaluation of the care rendered through audits, peer discussions, as well as the communication of results through feedback sessions to staff at Morbidity and Mortality (M and M) meetings.

Under the sub-theme Quality Assurance, the following clusters and sub-clusters were identified and are discussed below.

4.2.3.2.3.1   Cluster 1: Evaluation of care

Under the cluster evaluation of care, participants described that although it was helpful to conduct peer discussions and receive feedback after a child's condition had deteriorated, this was not always possible, or it was not always happening at this hospital. Participants also commented that feedback was normally given to staff after an unsuccessful resuscitation as opposed to a successful resuscitation or event.

> *"Only if it fails, they do an investigation from a quality assurance point of view. If it goes well, then it goes well"* **P2**

> *"I've never seen it here, but the time I worked in Saudi Arabia, when we did the resuscitation, so we then recorded everything. So when you write your slip [document] it goes for auditing. This is my experience with auditing overseas but not at [hospital name deleted]. So that is when you used to get feedback and whether, if its good you get incentives, and if it's bad they come and tell you ok this happened, they won't bring you down [positive feedback]. Yes, so that is why we all used to work, walk so tall, because ok, if this happens we know what to do next time"* **P3**

> *"Each department has their own M and M meetings [Morbidity and Mortality]. Yes, that's a way of auditing here, but with staffing issues, you can't send more than a certain number of staff so mostly it is just the sister in charge that goes. And that is actually an opportunity for you to maybe explain why it [an adverse event] happened like that and why things was like that..."* **P2**

4.2.3.3   THEME 3: Challenges in the Current Monitoring System Pertaining to Recognition of Clinical Deterioration

This was the third theme identified by the researcher. The data collected indicated the participants' personal experiences with regards to the challenges they have with regards to the recognition of clinical deterioration of children nursed in paediatric wards.

Table 4.4: Theme 3 and the identified clusters and sub-clusters.

Theme 3: Challenges in the Current Monitoring System Pertaining to Recognition of Clinical Deterioration		
Sub-theme	**Cluster**	**Sub-cluster**
Structure	• Training	• Lack of consistency • Orientation • Mentoring
	• Staff ratios and Acuities	• Shortage of staff • Quota • Based on international standards
	• Equipment	• Difference between wards • Calibration of
	• Policy's / protocols	• Age-appropriate vital signs chart • Access to policies
	• Administrative support	• Clerical
Process of Care	• Observing and reporting	• Without parents • Impact on parents • Different to adults
	• Documentation of care	• Nursing care plans • Patient progress reports • Dr's written orders
	• Staffing and overtime	• Productivity • Errors
	• Debriefing	• ICAS • Nursing staff awareness
Quality Assurance	• Evaluation of care	• Audits • Peer assessment • Communication of results

4.2.3.3.1   Sub-theme 1: Structure

As discussed previously, based on Avedis Donabedian's description of Structure (1966:170), the data provided by the participants was linked to their environment in which they provide health care.

As above, the data was again organised into clusters and sub-clusters and these are discussed below.

4.2.3.3.1.1   Cluster 1: Training

Although participants reported that there were numerous formal and informal training opportunities that were offered by the hospital that contributed positively to their ability to detect signs of clinical deterioration in children, there appeared to be an inconsistency with regards to the participant's experiences with training. This could be seen as a challenge in the current system pertaining to recognition of clinical deterioration in children nursed in paediatric wards. The researcher will discuss this aspect in detail under the theme Training factors related to the recognition of clinical deterioration.

4.2.3.3.1.2   Cluster 2: Staff ratios and Acuities

As discussed previously participants reported that general staff shortages, especially at night, as well as staff shortages related to absenteeism would make it more difficult for them to be able to detect clinical deterioration in children nursed in the wards. Numerous participants also expressed their concerns in being able to identify clinical deterioration in children due to the increased level of severity of illness of children that they are nursing in paediatric wards and thus the increased workload.

A major challenge, according to one participant, is that according to the allocated quota of all categories of staff per hospital they have met this quota in their hospital. However, in her opinion staff shortages remains a problem especially related to the severity of illness of the children nursed in the wards.

> *"Let me put it this way um, according to the Department of Health, they have a plan with regards to the numbers of staff…*
> - *They have a plan and they say [hospital name deleted], will only be allocated so many posts in terms of registered nurses, staff nurses and assistant nurses. So according to that plan, we have all our staff. We might be maybe four RN's short, so we've got 567 the last count for nursing staff of all categories, so according to the plan we have most of our staff. As people leave here we replaced them but it doesn't happen overnight, it takes a while. So yes, from that perspective we are challenged because we don't have entirely the total number of staff that we should be having. So, we are told that we have our quota of staff so we have to just work with the staff that we have. Ok, so that's the one challenge, so no matter how we say, listen, but we need more that would have to go to a higher level. You and I can't decide that at our level.*

- *At our level, we can write a motivation and say, for this and this and this reason, we need, I think we need more staff but it doesn't mean it is going to happen"* **P15**

The participant then goes on to say the following:

"So because the children are sicker, so it's more complicated. So you take longer, nursing this little body. One person spends more time with that little body than you would have with an adult. So those kinds of times [in those instances] I don't think we have worked it out. We haven't worked it out properly yet, the acuity levels, so according to the acuity level, you need to work out your number of staff.
- *Look they have done that [worked out acuity levels], they have done but I don't know if it is accurate. So if you look at staffing numbers of [hospital name deleted] and the other hospitals, [hospital names deleted], ok, you will say that we have more nursing staff than at adult hospitals because they have, they have worked it out [acuity levels], but I think they need to relook at it again. I don't think we've worked out a standard for our country. I'm saying I think our acuity levels are based on international standards possibly. Is there a standard based on research for South Africa i.e. staff: patient ratios*
- *I think they are more clued up overseas, they do these things, so they have a standard, I don't think we have a standard for our country in terms of acuity levels for children"* **P15**

4.2.3.3.1.3   Cluster 3: Equipment

As discussed previously, numerous participants expressed concerns related to the shortages, availability and servicing or calibration of equipment. However, some participants felt that they had sufficient equipment in their areas due to recent updates but they were unsure of when last the equipment was calibrated. Some participants also expressed the need for additional equipment in their areas but were concerned whether they would have sufficient staff to monitor the equipment. This is depicted below:

"They renovated our ward recently, so ya, we've got enough equipment, so we've got enough heart monitors and Sats [oxygen saturation] monitors." [differences between wards] **P2**

"Yes we do have sufficient Sats [oxygen saturation] monitors. Um I don't think they are calibrated regularly" **P6**

"In my ward I think we are well-equipped. It was only the defibrillator; we only had one defibrillator between two wards. Now ok, so now this child arrested and we needed it now, so we had to run to the other ward [to get the defibrillator] that was in the early hours" [of the morning] **P9**

"We need a monitor at each bed, sometimes patients need to be monitored just in case anything happens, instead of running and fetching a monitor from another patient's bed. At least each bed must have a monitor. But I don't know if there will be enough people to monitor the monitors at each bed" **P14**

4.2.3.3.1.4   Cluster 4: Policies, Procedures and/or protocols

One of the challenges pertaining to the current monitoring system is whether guidelines in the format of policies, procedures and protocols are available to nursing staff. Another form of a guideline is age-appropriate vital signs charts which are reference charts that are used in paediatric settings.   They assist staff with the normal ranges of measurements of temperature, pulse rate, respiratory rate and blood pressure (abbreviated TPR and BP) according to age. Participants expressed the following with regards to guidelines that were or were not in place:

"Yes we do have a policy for when the child deteriorates and then stops breathing, what to do and who to call [resuscitation policy]" **P6**

"I haven't seen the protocol regarding what to do if a child's condition is deteriorating, but what I've observed is that when the condition of the child is deteriorating, they call the doctor..." **P7**

"We only have resuscitation policies for cardiac arrest, not a specific policy on what to do if a child's condition deteriorates" **P11**

"There is one in the High Care [age-appropriate vital signs reference chart], and we have the policy files also that nurses have to read" [does not specify what policies] **P6**

"Not all the wards have age-appropriate vital signs charts. We also have policies; maybe it's in the K drives or whatever, in the computer which is not accessible to everyone" **P7**

"...It's not accessible to everybody [policies on the computer]. That's the thing that I've been complaining about" **P6**

"We also need clear guidelines on doing things..." **P7**

"Guidelines on what is it that I need to do if immediately if I see that child because if I do that thing immediately then the clinical symptoms won't go down [deteriorate]. So that protocol anywhere where it can be accessible. There are, we do have standard care plans. But what I'm thinking of, is like, when a certain patient comes, what is it that I am expected to do

initially; I mean those kind of guidelines. I'm not speaking about the care now" **P5**

"...we have age appropriate vital signs displayed on the wall in the High care cubicles, not in the ward" **P9**

"That would be nice to have age-appropriate vital signs displayed in all areas, it's like not too small in the nursing file, and we can stick it on each patient's file. Ya, and it will be beneficial for the students and the nurses" **P16**

4.2.3.3.1.5   Cluster 5: Administrative support

Although some participants expressed that the lack of clerical support, especially at night, was a problem as they were spending time on administrative duties rather than on nursing duties, some participants did not feel that this was a problem. The following quotations express this:

"Because often, because often nurses we are doing, we are spending so much time on clerical things. There are, there are admin [administrative] people in each ward, it works well in some areas and it doesn't work in other areas" **P15**

"We do have a receptionist and we do have an admin, but the office is far away from the area where the, she has her own specific office, and then the receptionist is on the outpatient side but not in the ward and most of the time the nurses answer the phone" [does not work well in her ward] **P14**

"Actually, we've got a secretary, two secretaries. One that is doing the doctors, all the summaries and stuff, and the other one that is in the clinic area with the sister. It's just one thing in our office, the phone...[enough administrative staff but the phone is a problem]. The phone, you know the phone will ring, and then it's for the doctors on that side of the clinic.

- *Yes I do answers phone a lot. It's a problem. We've got a mobile phone, we've got one, but people very seldom phone on that one [people not using mobile phone number but rather using ward number]"* **P16**

"Like for us, the phone is not a problem, because we've got a lot of doctors, we've got clerks around, we've got interpreters around, so it is not a problem in the short stay ward.

- *So not really, no it doesn't keep you away from your patient's"* **P17**

4.2.3.3.2   Sub-theme 2: Process of Care

As discussed earlier, according to Avedis Donabedian (1966:169), Process of Care is the method by which health care is provided. Thus, the data provided by the participants was linked to their challenges regarding the method by which they provide health care. Under the sub-theme Process of Care, the following clusters and sub-clusters were identified and are discussed below.

4.2.3.3.2.1   Cluster 1: Observing and Reporting

Under the cluster observing and reporting, as discussed previously, participants stated that it was sometimes difficult to observe clinical deterioration given the setting in which they provide their health care. One of the challenges reported by participants is the need for parental involvement to assist them to observe their children and report if something is wrong and the impact this may have on the parents:

> *"If the mom is there she is used as a mode of communication to report a problem"* **P12**

> *"Ya, it is a problem if the parents are not there at the bedside"* **P17**

> *"Can I just say we must also think about the second patient here, the mother/family of the child that we must accommodate in our nursing care. As one matron said, parents should be part of our patient care at [hospital name deleted]"* **P10**

> *"Yes, and everybody is worried at home, she [the mother] is sitting at the bedside perhaps for months in the medical ward. And it's a strain sitting in the hospital for the mom"* **P12**

> *"And if a relationship between a mother and a child is good the child recovers quicker [personal experience]"* **P11**

Another challenge is that participants reported that the observing of a child is different in comparison to the observing of an adult patient:

> *"Ok, the thing that I seen that it is only a few months that I'm working here, the children like um they are more complicated than the adults. Because you can like, you can do the observations within ten minutes, then you come back and the observations have changed already. You can take the respiration, then you come back then the respiration is another thing you see..."* **P8**

4.2.3.3.2.2   Cluster 2: Documentation of care

Documentation of care involves the documenting of nursing care plans, the patient progress reports, the vital signs charts and the Doctor's written orders specifically.   Although participants stated that these documents assist nurses with a record and prescription that can be referred to when a child's condition is deteriorating or has deteriorated, there appears to be a discrepancy between various disciplines pertaining to this:

> *"We do observations according to what the prescription says. Some doctors want it three hourly, four hourly, you understand, so we go according to what is prescribed [observations].*
> - *sometimes you do have neurological observations according to the level of consciousness [of the patient], according to what the doctor wants. And the thing is this, we also do observations when you see there is something wrong with the child [no prescription required]"* ***P6***

> *"...the observations we take are in terms of temperature, pulse and respiration, so that is done six hourly in our ward. When we do the doctors round they do specify what they need. I mean there is a good communication between us but it's not like written on the paper. They just give instructions, if the temperature is this you must do this, but not on the paper, it is just communication [no formal prescription written down]"* ***P14***

4.2.3.3.2.3   Cluster 3: Staffing and overtime

With regards to the method that health care is provided, participants reported previously that general staff shortages as well as staff shortages related to absenteeism makes it more difficult for them to be able to detect clinical deterioration in children nursed in the wards. One of the challenges experienced by participants is that staff who work overtime to provide extra staff cover eventually become tired and sick and start making mistakes.

> *"You can book overtime to get more staff"* ***P9***

> *"Staff can book overtime"* ***P10***

> *"...you see overtime, if excess overtime you become unproductive and you get sick and you get tired, you make mistakes. That's what we see"* ***P9, P10, P11, P12***

4.2.3.3.2.4   Cluster 4: Debriefing

Under the cluster debriefing, participants reported that there are formal and informal processes in place for staff to receive emotional/trauma debriefing following distressing or adverse events such as the death of a patient. Although one of the benefits of this is to help the staff to deal with their loss and to restore their confidence in their own ability, one participant expressed that too much repetition was actually a problem for her. The following quotation from the participant depicts this:

> *"But sometimes, let me come to this, because now you have to go and sit and this lady is coming or whoever is coming from ICAS, it is sort of a repetition. The minister will come tomorrow and you start afresh [tell your story again] and you think you are healing and then you have to start again. That was the only problem with me because you have to tell the story again, you know, you don't really come to a closure and more especially if a child dies. Sometimes I think it is too much. Yes, the programme is there and it is helping but I'm not sure whether the way it is done each and every time tomorrow and the other day it is helping"* **P4**

4.2.3.3.3   Sub-theme 3: Quality Assurance

As discussed previously, for the purpose of this study, rather than assessing the quality of the care provided, the researcher looked at the participants' comments and experiences with regards to "Quality assurance processes" that may have been in place.

This may be the evaluation of the care rendered through audits, peer discussions, as well as the communication of results through feedback sessions to staff at Morbidity and Mortality (M and M) meetings. Under the sub-theme Quality Assurance, the following cluster and sub-clusters were identified and are discussed below.

4.2.3.3.3.1   Cluster 1: Evaluation of care

Participants described that although it was helpful to conduct peer discussions and receive feedback after a child's condition had deteriorated, one of the challenges was that it was not always possible to attend or it was not always happening at this hospital.

> *"I've never seen it here [at this hospital], but the time I worked in Saudi Arabia, your resuscitations would go for auditing and also, and then a certain department is asked to go and audit another department, [experience with peer assessment audits done in another hospital*

*overseas]. So that is when you used to get feedback. Yes, so that is why
we all used to work, walk so tall because ok, if this happens we know what
to do next time"* **P3**

*"Each department [at this hospital] has their own M and M meetings
[Morbidity and Mortality meetings], but I think it is more doctors related.
Yes, more doctors related, then they [the doctors] would have a
complication book where they actually record the complications that they
experienced during the month and that is what they discuss and where they
can improve on what they did wrong.*

- *For staff it's normally, I won't say just the sister in charge goes [to M
and M meetings] but you know, with staffing issues, you can't send
more than a certain number of staff, so mostly it is just the sister in
charge that goes...*
- *And that is actually an opportunity for you [as the staff member] to
maybe explain why it happened like that and why things was like that"*
P2

4.2.3.4 THEME 4: Training Factors Related to Recognition of Clinical Deterioration

This was the fourth theme identified by the researcher. Although the researcher has
previously included Training under Theme one and Theme three, this was deemed to be
significant enough to present the data regarding training as an entity on its own.

Table 4.5: Theme 4 and the identified clusters and sub-clusters.

Theme 4: Training Factors Related to Recognition of Clinical Deterioration		
Sub-theme	**Cluster**	**Sub-cluster**
Structure	• Training - Orientation	• Orientation
	• Training - Mentoring	• Mentoring
	• Training – In-service	• In-service
	• Training - BPLS	• Basic Paediatric Life Support
	• Training – ICU technology	• CPAP • Monitors
Process of Care	• Observing and reporting	• Related to training
	• Early Warning Scores (EWS)	• Staff awareness
Quality Assurance	• Evaluation of training	• Mock resuscitations • Assessments

The data collected below indicates the participants' personal experiences with regards to their training and the challenges they may have with regards to the recognition of clinical deterioration of children nursed in paediatric wards.

4.2.3.4.1 Sub-theme 1: Structure

As discussed previously, based on Avedis Donabedian's description of Structure (1966:170), the data provided by the participants was linked to their environment in which they provide health care.

As above, the data was again organised into clusters and sub-clusters and these are discussed below.

4.2.3.4.1.1 Cluster 1: Training – Orientation

Participants reported that there were orientation programmes that were offered by the hospital that contributed positively to their ability to detect signs of clinical deterioration in children. However, these programmes are intended for new nurses and not for staff that have been there for a number of years. Adding to this, there also appeared to be an inconsistency with regards to the participant's experiences with orientation.

Firstly, orientation programmes are described by the participants as follows:

> "*They do include that topic in orientation" [made aware of what to do if a child's condition deteriorates] and the number that you have to phone for Red Box [resuscitation/code]"* **P4**

> "*On orientation, the new appointments learn how to nurse a sick child and what to do if a child arrests/deteriorates so call procedure"* **P9**

Secondly, orientation programmes for new nurses are not always attended appropriately as described by the participants below:

> "*...now in July it has been a year I have been working in the hospital" [has not done orientation yet]* **P1**

> "*I only had two days orientation. I was like, why do I have to go for only two days orientation? Because if the people that have come [started] in January, they have like a whole week of orientation, but I only have the two*

*days orientation" [appears to be lacking in consistency between orientation in wards as well as time of year one goes for hospital orientation] **P8***

4.2.3.4.1.2   Cluster 2: Training – Mentoring

Mentoring programmes, which are a form of training where longer-term nurses introduce newer nurses to the institution and teach specific tasks, are in place. This appears to differ from ward to ward and was described by the participants below:

"*One of the things I also noticed when I first started and because I was new, they gave me a mentor for three months which I think it's good because you have a lot of things to learn and that I also likes about this hospital because every person that comes in the ward have a mentor for three months, at least, and that one that mentors must at least work for a year or longer. So I think that is one of the good things I like about this hospital"* **P5**

"*It's difficult [to do mentoring] if you are so short staffed or short of sisters who normally does the mentoring for the new staff that come in"* **P10**

"*It's difficult, but we are doing it. So it's not like you have one mentor, on each shift we make sure that there is always someone that can be a mentor for that person"* **P9**

One participant said she thought they needed to have dedicated mentors per ward as opposed to senior staff members who were on duty at the time doing the mentoring:

"*There was another thing that I was going to say now, mentors, we need mentors in every single area [dedicated ward specific mentors]. We don't have mentors [dedicated ward specific mentors] in all our areas, we have one in ICU, and then in theatre we have mentors, but the rest of the hospital we don't have mentors [dedicated ward specific mentors]. The mentors in the wards now are just one of the registered nurses in your area. That's not her main function [the mentor in an area], that's not her core function, so we need specific mentors I'd say"* **P15**

4.2.3.4.1.3   Cluster 3: Training – In-service

Formal in-service training as well as in-service training organised by the staff of numerous departments is in place but appears to be inconsistent as described by the participants as follows:

"*Um, there is actually, ya, ya, if I had to that is actually the education roster for the year, this little one here with the different colours [pointing to an in-*

service training register on the wall]. So they do have um, staff nurse updates and nurses updates as well [talking about in-service training which includes topics on resuscitation and clinical deterioration]. It's inclusive, resus [resuscitation] training, or recognition of deterioration as in-service. I think it is once every month, so maybe one this month for staff nurses and maybe next month for the assistant nurses so" [talking about frequency of in-service training] **P2**

"Um, for me actually, I think they must bring back that formal in-service training, like every Tuesday they had it between 11 and 12 o' clock. They had this in-service every Tuesday for the nurses so every week a different nurse would go to update them. As I say like, I say they stopped it. So we actually are doing it on our own in our ward. It's our UM, Unit Manger who arranges in-service in the ward. But sometimes she's too busy also, because sometimes they have meetings on a Tuesday. But we arrange it amongst ourselves" **P6**

One participant describes her experience with regards to in-service training as follows:

"*Training ensures empowerment of the staff that is another thing. So whether it's through the wards or through the in-service department, there's got to be ongoing learning.*
- *Because you know that you find the knowledge in some other people becomes redundant you know. So we also need something to keep us going. Ja"* **P7**

Participants also reported on some of the challenges of doing in-service in the wards as well as away from the wards.

"I think it would work but I think cost wise it would cost too much to have regular updates on resuscitation and recognition of clinical deterioration as in-service. So then you are also taking that nurse or sister out of the ward. The phones are ringing, the doctors are coming in, so it wouldn't work to do in-service or practice in the ward" **P12**

"Yes, I think it is much better to be taken out the ward to get training" [like they used to] **P9**

"Unless you can divide yourselves, let's say if you are like ten, like today there are ten [staff]. They would take five people out and do whatever you would like to do so that there is someone in the ward, so if I am sitting here the ward is covered" **P10**

"...it takes time out of the ward, so that is also the big very big challenge. But I mean, if we want to train our people and we want to really keep up with that part of our system, then I will spend money on agency staff so that the staff, when they come out of the wards, they don't feel guilty sitting there because, 'hey, I've got so much work to do, why must I come and sit in this class the whole day" **P15**

One participant also commented on her experience with regards to in-service at night:

> *"At night, I think night people, we neglect the night people as far as in-service training goes.   There's no education at night, there's no real guidance at night"* ***P15***

4.2.3.4.1.4   Cluster 4: Training – Basic Paediatric Life Support (BPLS) courses

Basic Paediatric Life Support (BPLS) courses are offered by the hospital for nursing staff and staff are required to repeat this every four years in order to remain current in resuscitation training.   These courses are based on the UK (United Kingdom) Paediatric Basic Life Support courses as opposed to the AHA (American Heart Association) Basic Life Support courses. The significance of this is that staff are taught recognition of clinical deterioration as well as recognition of illness severity in children on the UK based BPLS course.

Participants reported the following with regards to the course teaching them about recognition of clinical deterioration in children:

> *"I think it only taught us about resuscitation" [the BPLS course]* ***P2***

> *"it is not only about resuscitation that they teach you on the course. But it was just how quickly you can respond and what you, what is your expectations and what would you see, what is the one that needs that support at that moment" [teach recognition of clinical deterioration]* **P6**

> *"Yes. [course assisted in being able to detect clinical deterioration in children]. You actually more alert also now"* ***P16***

> *"Yes, they teach you how to recognise a deteriorating child" [on the course]* ***P14***

> *"It does in a way teach you with how to recognise serious illness and deal with children who are deteriorating in the wards, but sometimes, the thing is, that course [BPLS] it depends on us [as individuals] because we are not the same. Some of the people they react, and some practically they freeze up like you don't know anything [talking about experience on the course and retention of knowledge], but it does help" [BPLS course]* ***P10***

One participant reported that she had had no training whatsoever with regards to resuscitation:

> *" ah. No, nothing around resuscitation training, no BPLS and no in-service around resuscitation since I started at [hospital name deleted]"* ***P7***

With regards to how many participants had been on a BPLS course in the last four years the number calculated was n = 11 (64.7% out of 17 participants). Participants reported the following as reasons for not having attended within four years:

> *"Not yet. I'm doing BPLS in November, I haven't done orientation yet either, I haven't been orientated but they did send me to do the high care course, so I'll only be doing my BPLS in November" [has been here over one year which included the one year compulsory community service]* **P1**

> *"Two to three years [has been here for 2-3 yrs and has not been to BPLS]. They booked me but I was on leave, so they still need to like to set another date for me"* **P13**

Participants then responded in the following way when asked by the researcher whether they thought every four years was often enough to do a BPLS course:

> *"No, [not often enough]. [has attended BPLS in last four years]"* **P9**

> *"No, [not often enough]. [has attended BPLS in last four years]"* **P10**

> *[two participants shaking their heads, i.e. not frequent enough] [have attended BPLS in last four years]* **P11 and P12**

> *"Ya [yes], four years ago [attended BPLS], I also need to go again sometime in November. You need to update it every four years.*
> - *Every 4 years, Ah, honestly, no I do not think it is often enough. I come from a surgical background and we don't have a lot of cases where the children deteriorate so much. So it's not, I won't say it's not fresh [in my mind] but if you don't practice something [it can be a problem], you don't lose it altogether, but ok, what I'm saying, I would like it more, and ya [yes] more frequently, ya, [yes] I think every four years it's a bit long"* **P2**

One participant agreed that every four years was not often enough as well as saying that the actual one day BPLS course was too long

> *"Yes I also think so [not often enough] and that Basic Life Support course, It's a lot on one day. I think that if they can maybe like break it up over two to three days. Because this is really a lot on one day. So sometimes there's just thirty minutes or one hour on this specific thing and then you still need more time. Its really to experience it [to get the benefit of the course], that it's a lot for one day, it's just too much, so then you just like pick on everything [select certain things] only"* **P5**

4.2.3.4.1.5   Cluster 5: Training – ICU technology in wards

As discussed previously, participants reported that often the lack of ICU beds resulted in them having to nurse critically ill children in the High Care cubicles in their wards. Participants felt that they often lacked the experience necessary to nurse these children, especially those children nursed with ICU technology, for example, CPAP [Continuous Positive Airway Pressure] machines and ventilators.   However, participants reported that they had received training with regards to CPAP machines specifically:

> *"We are not trained to look after ICU patients, but recently they gave us some in-service training on CPAP. A Sister [from the clinical department] she came around and she gave us training, because the load [work load] was so much and sometimes you have two CPAPs in your ward in the High Care. So this was why they saw the significance to come to give in-service to the nurses in high care. Just to get us used to this CPAP and nursing these patient's"* **P10**

> *"I don't know about the other wards but because some of us never got exposed to the CPAP [Continuous Positive Airway Pressure machines], so sometimes we had to put a patient on the CPAP and we never knew how to do that. So we told them [the training department], we don't know what to look for, at the whole setup of the CPAP, what do you chart, where must the water level be and all those things. So that's why they came and gave us in-service. And I think because we take more and more CPAP patients, more into the wards than go to ICU, that's why they [the training department] came and give in-service"* **P9**

Participants also reported that all staff had been trained on the use of various monitors that they use in the wards, for example, oxygen saturation monitors, blood pressure monitors and cardiac monitors:

> *"Yes, they [staff] are all trained [on how to use the monitors], and on orientation they are trained"* [as well] **P9**

4.2.3.4.2   Sub-theme 2: Process of Care

Process of Care is the method by which health care is provided as discussed above. Thus, the data provided by the participants was linked to their training they received in relation to the method by which they provide health care.

Under the sub-theme Process of Care, the following clusters and sub-clusters were identified and are discussed below.

4.2.3.4.2.1   Cluster 1: Observing and Reporting

Under the cluster observing and reporting, as discussed previously, participants stated that it was sometimes difficult to observe clinical deterioration given the setting in which they provided their health care. However, participants reported that the various training they had received assisted them to be able to recognise clinical deterioration in children:

> *"I've never worked anywhere else except for the Cancer ward, so I've grown to love it because the working environment, the staff, the operational management have equipped me [through various training]. They orientate you; they facilitate you for you to grow. I got my mentor in 2008, she was like wonderful. Ya [yes], she was keeping me under her arm and showed me everything"* **P14**

> *"They are not sending ICU trained staff [to the wards when the children are sicker], so everybody working in those areas has been trained [on various equipment and the procedure to follow when a child's condition is deteriorating].*
> * *Firstly, to nurse that child on CPAP [the staff have been trained], and then obviously there is guidance from this department [training department] to go into the wards to go an assist them.*
> * *And the procedure to follow when a child's condition is deteriorating or the child has collapsed.*
> * *It's still an extra workload on the nurses [even though you have been trained], one of the challenges is possibly to do with you've got limited resources in the ward, you might be trained on that [CPAP and procedures] but it is still an extra workload on the nurses"* **P15**

> *"Like there will be, sometimes there's people [doctors, sisters, training department] who come to explain about anything, anything related to the patient. So this in-service training can assist us in recognition of clinical deterioration in a child"* **P17**

> *"It does help the BLS and how to recognise clinical deterioration [in a child], because if you are on night duty, then you will find out you have got this sick child in the ward and the doctor is busy in another ward, and we can carry on..."* **P9**

4.2.3.4.2.2   Cluster 2: Early Warning Scores (EWS)

Paediatric 'early warning scores' are being used globally to identify children at risk of clinical deterioration in ward settings. Participants were asked if they were aware of paediatric 'early warning' tools and most of them reported that they had not heard of early warning systems.

Three participants stated that they were aware of and had seen examples of 'early warning 'tools; one participant referred to the Accident and Emergency department's triage tool, which is a system similar in principle to the 'early warning tool'. The other two participants expressed that they had seen the tool and felt that it would be beneficial to have such a tool at this hospital:

> *"The paediatric early warning score seems similar to the Med Reg [Accident and Emergency Department] triage patient's one" [tool]* **P11**

> *"Yes I saw that [Early Warning Score]. I saw that at [a private hospital in Cape Town]. It will be nice if they had it here. It must be done small [talking about an early warning score] so you can just stick it in the patients file" [to refer to]* **P16**

> *"You know what you just said here [talking about 'early warning tools'], I am sure some of us did come across this, but it's not here. Yes I think it will be beneficial"* **P3**

With regards to whether the participants thought it would be beneficial to have an 'early warning tool in their hospital they reported the following:

> *"I think it could [be beneficial], because I don't know, in terms of our ward, when we do the doctors rounds they do specify what they need, there is a good communication between us, but it's not like written on the paper. There is no written guideline. I think it would be a good thing to do have an Early Warning guideline"* **P14**

> *"It will make the ward work easier to have one guideline"* **P13**

> *"Because there is a lot of students coming in and out the ward every month, so for you to have a tool to give to them, I think that would be beneficial for them and for the ward at large"* **P3**

> *"It would be very useful. Ya [yes], it would be beneficial, but the nurses will just moan because it is more work for them to do"* **P6**

> *"...It would help, but change sometimes, they [the staff] are used to doing things like this [in a certain way], like checking the Temps [Temperatures], if nothing is wrong they won't tell you. But the challenge is now what must they score [saying the tool may not be so easy to use], but they will tell you if something is wrong. But it would help"* [Early Warning System] **P10**

4.2.3.4.3 Sub-theme 3: Quality Assurance

As discussed previously, for the purpose of this study, rather than assessing the quality of the care provided, the researcher looked at the participants' comments and experiences with regards to "Quality assurance processes" that may have been in place.

Under the sub-theme Quality Assurance, the following cluster and sub-clusters were identified and are discussed below.

4.2.3.4.3.1 Cluster 1: Evaluation of training

Assessments can be done in hospitals to evaluate the training that has taken place. These can be in the form of peer assessments or simulated events to improve on retention of knowledge. The participants were asked whether such evaluation of training was occurring in their place of work. One participant responded in the following way:

> *"No, we don't have any refresher courses [related to resuscitation training and clinical deterioration in children]. We do orientation of new staff; we orientate them about that kind of thing. No, we don't have mock resuscitations [simulated resuscitation events], we only have, we have only got, I don't know if this will qualify, but we do run a Cardiac Care Course at least once a year"* **P15**

The participants were therefore not aware or had not been personally involved in assessments to evaluate the training that had taken place.

4.3 CONCLUSION

In this chapter, the data collected from this study was analysed and the research results were presented. The data analysis in this research used a process adapted from Miles and Huberman (1998:92). The process stages involved summarising and packaging the data, repackaging and aggregating the data, and developing and testing propositions to construct an explanatory framework.

The results of using this process yielded four main themes, each with sub themes and lower level clusters of data.

Theme 1: Positive experiences regarding recognition of clinical deterioration, training and learning opportunities were reported as significant enabling factor for nurses. Structured career advancement opportunities, job satisfaction, as well as communication and teamwork played positive roles. The documentation and evaluation of care impacted positively on being able to care for a child adequately.

Theme 2: Negative experiences regarding recognition of clinical deterioration, the level of severity of illness of children nursed in wards as well as the shortage of adequate resources, namely, ICU beds, staff, equipment and lack of clerical support negatively impacts on being able to care for a child adequately. Training inconsistency was also reported in this theme.

Theme 3: Challenges in the current monitoring system related to recognition of clinical deterioration, training inconsistency, staff and equipment shortages, adequacy of guidelines, may be compounding issues in the recognition of clinical deterioration.

Theme 4: Experiences regarding training related to recognition of clinical deterioration, the data presented discussed the challenges related to training in all forms: orientation, mentoring, in-service training, BPLS training, ICU technology training. This theme relating to training occurred frequently throughout the other themes, and as such was presented as an entity on its own.

Chapter five will present an overview of the objectives achieved based on the findings of the study, the limitations of the study, and recommendations emerging from the study.

CHAPTER 5
DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1   INTRODUCTION

This chapter discusses the data according to the objectives, recommendations, limitations of the study, and conclusions from the research conducted. The conclusions will cover the objectives of the research and the findings obtained in the research question posed for this study.

5.2   RESEARCH PURPOSE

The purpose of the study was to establish registered professional nurses' perceptions and experiences about their knowledge, training and clinical practice in the recognition of unexpected clinical deterioration in children nursed in paediatric wards. The findings of the study would then determine whether a formal guideline to assist nurses in the early recognition of clinical deterioration in children would be beneficial.

5.3   DISCUSSION

The discussion will be presented in relation to the objectives of the study. The objectives were to explore:

1. Positive experiences regarding recognition of clinical deterioration in children nursed in wards;
2. Negative experiences regarding recognition of clinical deterioration in children nursed in wards;
3. Perceptions regarding challenges in the current monitoring system pertaining to the recognition of clinical deterioration in children nursed in wards; and
4. Experiences regarding training specifically related to recognition of clinical deterioration in children nursed in wards.

5.3.1   OBJECTIVE 1:   TO EXPLORE POSITIVE EXPERIENCES REGARDING RECOGNITION OF CLINICAL DETERIORATION IN CHILDREN NURSED IN WARDS

The findings in this study suggest that there are many positive factors that are linked to nurses being able to recognise clinical deterioration in children nursed in wards.

It was reported that the availability of numerous learning opportunities contributed positively towards staff's ability to be able to detect signs of clinical deterioration in children. These included orientation programmes, mentoring programmes, in-service education programmes, Basic Paediatric Life Support (BPLS) courses as well as structured career advancement courses which would enable them to update their knowledge and skills. It was also reported that the carrying out of clinical rounds in the wards at least once a day was beneficial in raising staff awareness of children in their care.

Along with learning opportunities, another factor that inspired staff to provide quality patient care was their sense of belonging, job satisfaction and ultimately their intention to stay in their profession and current place of work. This is substantiated by another study that showed that job satisfaction positively impacts on nurses' intention to stay and the quality of patient care provided in a paediatric setting (Ernst, Franco, Messmer & Gonzalez, 2004:4).

Participants experienced teamwork and clear communication between staff, doctors and management as beneficial components for them to detect clinical deterioration in children. This is supported by Leonard, Graham and Bonacum (2004:i90), where they say that "effective teamwork and communication is paramount for safe patient care". It was also reported by participants that parental involvement played a vital role with regards to the observing and reporting of clinical deterioration of children nursed in paediatric wards. This is in line with a paper describing how, over the last fifty years, hospitals have shifted from excluding parents to now accepting them as participants in their child's care (Davies, 2010:6).

It was evident that all staff are aware of the procedure to follow when a child's condition is deteriorating.   Along with this, it was reported that various documentation involving a patient's care, namely, nursing care plans, the patient progress reports, the vital signs charts and specifically doctor's written orders, assists nurses with a record and prescription that can be referred to when a child's condition is deteriorating or has deteriorated.

When a child's condition had deteriorated, it was reported that there were formal and informal processes in place for staff to receive emotional/trauma debriefing following distressing or adverse events such as the death of the child. Participants described the benefits of such an opportunity as assisting them to come to terms with the loss of a child, to ensure it does not hinder their ability to face similar situations, and to help restore their confidence in their own ability. As shown by Keene, Hutton, Hall and Rushton (2010:189), it is crucial for health care professionals caring for children to manage their grief with effective interventions. Without the ability to manage one's grief in healthy ways, this may result in less-than-optimal care for patients and their families.

To evaluate the care that a patient has received, participants described that it was helpful to conduct peer discussions and receive feedback after a child's condition had deteriorated. They also reported that the carrying out of a hospital audit was beneficial for ensuring adherence to policies and procedures.

5.3.2   OBJECTIVE 2:   TO EXPLORE NEGATIVE EXPERIENCES REGARDING RECOGNITION OF CLINICAL DETERIORATION IN CHILDREN NURSED IN WARDS

The findings in this study suggest that there are also negative factors that are linked to being able to recognise clinical deterioration in children nursed in wards. These will be discussed below.

Numerous participants expressed their concerns in being able to identify clinical deterioration in children timeously due to the increased "level of severity of illness" (patient acuity) of children that they are nursing in paediatric wards. They expressed that the increased acuities could be due to firstly the disease profile in South Africa, namely, Tuberculosis (TB), Human Immunodeficiency Virus (HIV) and malnutrition, and secondly social issues in the community. Participants expressed that nursing sicker patients in the wards resulted in an increased workload on the staff; in addition they reported that the risk of failure to recognise clinical deterioration in children in their care was thus increased.

According to Richter, Rochat, Hsiao and Zuma (2010:1), more than 60 percent of paediatric wards in public hospitals in South Africa are occupied by children admitted with AIDS-related illnesses, which puts enormous pressure and an increased responsibility on nurses in

paediatric wards caring for these acutely ill and terminally ill patients. This is supported by another study carried out at the Red Cross War Memorial Children's Hospital in Cape Town, South Africa. The authors state that despite the prevention of mother-to-child HIV transmission interventions, paediatric antiretroviral programmes, and immunisation programmes, HIV infection and TB contribute substantially to the general paediatric workload at the hospital (Weakley et. al., 2009:55).

It was also reported that the lack of Intensive Care Unit (ICU) beds contributed greatly to the fact that sicker patients were being nursed in paediatric wards by nursing staff who were not always adequately equipped to do so. It was also noted that guidelines have had to be adjusted in order to accommodate certain children in wards as opposed to an ICU, and as a result they have to observe these children more closely. Substantiating this in a study by Bhagwanjee and Scribante (2007:1311), it was reported that there is a national shortage of ICU beds in South Africa. Only 19.6% of beds have been allocated to paediatric and neonatal ICU patients in the private and public sector. As a result, children who are critically ill are being nursed in the general wards when ICU beds are not available.

Participants also expressed concerns related to the increased number of occupied beds per ward, which exacerbates staff shortages, lack of equipment and adequate patient care. For these participants, general staff shortages as well as staff shortages related to absenteeism, and the subsequently altered staff to patient ratios, would make it more difficult for them to be able to detect clinical deterioration in children nursed in the wards. Participants also reported that the shortage of staff was particularly a problem on night duty and during lunch and tea breaks, as this compromised their ability to observe the condition of the children in their care.

The relationship between nurse staffing and quality of care for hospitalised children is a global concern. A study carried out in South Africa states that "although optimal patient/nurse ratios remain unclear in a paediatric setting, general paediatric wards in South Africa, with a large proportion of patients requiring high-care monitoring or interventions, should be staffed by a higher proportion of professional nurses" (Weakley, et. al., 2009:59). Substantiating this is research done in California, USA by Mark, David, Hartless and Berman (2007:83), where they concluded that more hours of care provided by registered/professional nurses was associated with an improved quality of care for hospitalised paediatric patients.

Regarding equipment, participants expressed concerns related to the shortages, availability and servicing, and calibration of equipment. As a result, participants felt that they were not

always able to care for the child adequately under these circumstances. For example, they said that occasionally they had to share equipment between wards, and this impacted on their efficiency. On an additional note relating to equipment, participants felt that they often lacked the technological experience and training necessary to nurse these children, especially those children nursed with ICU technology, for example, Continuous Positive Airway Pressure (CPAP) machines and ventilators. The South African Department of Health's National Core Standards (2011:30) state that facilities are required to have essential equipment available. It must be appropriate to the level of care as well as appropriately placed in the facility, accessible, serviced/calibrated and maintained according to the manufacturer's instructions.

Participants also expressed that in some instances the lack of clerical support, especially at night, was a problem as they were spending time on administrative duties (for example, answering phones, ordering stock, etc.) rather than on nursing duties.

Under the circumstances described above, participants stated that it was sometimes difficult to observe and report clinical deterioration in children in their care. Additionally, reporting of problems is sometimes missed by new students in the wards and therefore the detection of clinical problems may be delayed.

Although participants expressed the need for parental involvement to assist them to observe their children and report if something is wrong, some participants noted an increased risk of having the parents too closely involved. For example, participants recounted experiences where parents had inadvertently interfered with or even unplugged monitoring equipment to sometimes charge their mobile phones.

Regarding evaluation of care, participants described that although it was helpful to conduct peer discussions and receive feedback after a child's condition had deteriorated, this was not always possible, or it was not a regular occurance at this hospital. Participants also commented that feedback was normally given to staff after an unsuccessful resuscitation as opposed to a successful resuscitation or event. The implication of this is that the approach is reactive more than proactive in applying the practice of detecting clinical deterioration.

5.3.3   OBJECTIVE 3:   TO EXPLORE CHALLENGES IN THE CURRENT MONITORING SYSTEM PERTAINING TO CLINICAL DETERIORATION IN CHILDREN NURSED IN WARDS

The findings in this study suggest that there are numerous challenges in the current monitoring system pertaining to detection of clinical deterioration in children nursed in wards.

Although participants reported that there were numerous formal and informal training opportunities that were offered by the hospital that contributed positively to their ability to detect signs of clinical deterioration in children, there appeared to be an inconsistency with regards to the participants' experiences with training. For example, some staff members experienced delays in attending orientation programmes; mentors are more readily available in some wards than others; formalised in-service training was lacking in some areas and sporadic in others; and in particular in-service training was lacking for night staff. According to Booyens (2008:212), "core components of staff development includes an organisational culture that fosters continuing learning for all levels of healthcare workers, efficient orientation of new nurses, and mentoring programmes that provide a framework for the retention of new and existing staff members."

As discussed previously participants reported that general staff shortages, especially at night, as well as staff shortages related to absenteeism make it more difficult for them to be able to detect clinical deterioration in children nursed in the wards. Participants expressed their view that, despite the statistics indicating that their hospital's staff quota was fulfilled, the quota does not take into consideration important realities in their nursing situation: firstly, there is an increased level of severity of illness of children that they are nursing in paediatric wards, related to the disease profile in South Africa; secondly, their experience is that it is more time consuming to nurse sicker children than sicker adults. The relevance of this is that staff shortages are particularly influential on nurses' ability to identify clinical deterioration in children due to the increased workload. A further compounding challenge experienced by participants is that staff who work overtime to provide extra staff cover eventually become tired or sick and start making mistakes.

As discussed previously, numerous participants expressed concerns related to the shortages, availability and servicing or calibration of equipment. Some participants felt that although they had sufficient equipment in their areas, they were unsure of when last the

equipment was calibrated.   Some participants were concerned whether there would be sufficient staff to monitor the equipment.

Another challenge pertaining to the current monitoring system is whether guidelines in the form of policies, procedures and protocols are available to nursing staff.   Participants reported that the availability of guidelines varied from ward to ward, which implies there is an inconsistency in this regard.   There also appears to be a discrepancy pertaining to the documentation of care; various disciplines seem to apply different standards of monitoring according to doctors' prescriptions. The South African Department of Health's National Core Standards (2011:15) propose that healthcare establishments utilise national and provincial guidelines, policies and protocols that guide diagnosis, treatment and care.

One of the challenges reported by participants is the impact on the parents of their expected involvement to assist nurses to observe their children and report on clinical signs. On some occasions parents are not present at all; or when parents are present and involved, they experience strain during prolonged hospitalisation of their child.   In either case, the effectiveness of their involvement is compromised.

Participants described that although it was helpful to conduct peer discussions and receive feedback after a child's condition had deteriorated, one of the challenges was that it was not always possible for staff to attend or it was not always happening at this hospital. It was also reported that although each department conducted their own Morbidity and Mortality (M and M) meetings as a method of auditing, due to staff shortages only the sister in charge of the unit would regularly attend.

5.3.4   OBJECTIVE 4:   TO EXPLORE EXPERIENCES REGARDING TRAINING SPECIFICALLY RELATED TO RECOGNITION OF CLINICAL DETERIORATION IN CHILDREN NURSED IN WARDS

The findings in this study suggest that there are numerous challenges regarding training specifically pertaining to detection of clinical deterioration in children nursed in wards. Although the topic of training has been commented on in the previous three objectives, the researcher observed that the recurring frequency of this theme was significant and thus warranted a focused discussion of this topic as an entity on its own.

Participants reported that there were beneficial orientation programmes that were offered by the hospital that included the topic of recognition of clinical deterioration in children. However, orientation programmes are intended for new nurses and not for experienced staff. This potentially useful training information is therefore not made available to the experienced nursing staff.

Mentoring programmes, which are a form of training where longer-term nurses introduce newer nurses to the institution and teach specific tasks, are in place. However, it was observed that the mentors comprised senior staff members who were on duty at the time as opposed to dedicated mentors. An implication of this is that standards of mentoring can vary. It is uncertain whether there is specific focus and development of the competency of a nurse during the mentoring process to recognise clinical deterioration in children.

Formal in-service training as well as in-service training organised by the staff of numerous departments is in place but appears to be inconsistent as described by the participants. Firstly, not all staff have access to in-service training (particularly night staff); secondly, because this type of training is organised by different departments and disciplines, the standards and content of training may vary, the latter specifically related to recognition of clinical deterioration in children; thirdly, it is unclear whether staff in different wards receive the same frequency of training.

Participants also reported on some of the challenges of doing in-service in the wards as well as away from the wards. They expressed the view that the cost of training is a problem and may curtail regular updates, refreshers and related training. It is difficult if not impossible to conduct training in the wards during busy times, and taking staff away from the wards to do training leaves the wards shorthanded. Their concern was that if external relief staff were to be employed to cover the ward, there would be an extra cost implication.

Basic Paediatric Life Support (BPLS) courses are offered by the hospital for nursing staff and nurses are required to attend these courses every four years in order to remain current in resuscitation training. Included in this training is the recognition of clinical deterioration and serious illness. However, not all nurses are current, that is, having attended in the last four years, and even those who are current expressed the view that only attending every four years is too long an interval in this type of training. Supporting this, Sutton et. al. (2011:e146) identified that universally, poor skill retention by healthcare providers occurs three to six months after cardio-pulmonary resuscitation (CPR) training. Their study

concluded that brief bedside CPR booster training (simulated resuscitation) is effective in improving CPR skill retention of paediatric in-hospital BPLS providers.

As discussed previously, participants reported that often the lack of ICU beds resulted in their having to nurse critically ill children in the High Care cubicles in their wards. Participants felt that they often lacked the experience necessary for ICU technology, despite having received training on technology such as Continuous Positive Airway Pressure (CPAP) machines and ventilators. Participants also reported that all staff had been trained on the use of various monitors in the wards, for example, oxygen saturation monitors, blood pressure monitors and cardiac monitors. However, although they had been trained on the use of the equipment, as ward nurses they lacked specific ICU training and experience.

Despite the above potential issues, participants reported that the various training they had received did assist them to be able to recognise clinical deterioration in children nursed in wards. As professional competencies directly impact on the quality of care being provided to patients, continuing professional development is required in terms of applicable legislation in South Africa (National Department of Health, A policy on quality in health care in South Africa, 2007:16)

Most participants reported that they had not heard of 'early warning systems' and that there is no paediatric 'early warning scores' (PEWS) in place. As such there is no training in the hospital regarding these. Paediatric early warning scores are used globally to identify children at risk of clinical deterioration in ward settings. Most participants reported that they believed such a system would be beneficial, but had concerns regarding the time it would take to score a patient, the training involved, and the ease of use of the tool. Related research indicates that the time needed to score a patient is minimal, but that there is relatively extensive training required for implementation of such a tool.

Assessments can be done in hospitals to evaluate the training that has taken place. These can be in the form of peer assessments or simulated events to improve on retention of knowledge and skills. The participants were not aware of, or had not been personally involved in, assessments related to evaluation of training that had taken place.

5.4   LIMITATIONS OF THE STUDY

The following limitations of the study are noted.

Sample size: despite participants representing a range of disciplines within the hospital, the overall sample of seventeen is considered to be small by research standards. However, in the context of qualitative research, the focus is less on quantities of subjects and more on the depth of information that participants generate.

The sample derived from one health care institution, and therefore the information generated can only be said to represent that one hospital. It will be beneficial to elicit data from other institutions, for corroboration and/or refutation of the data gathered in this study.

Focus group interviews were on occasion affected by time limitations, as the interviews were conducted during working hours. This may have affected data collection to an unspecified extent. However, all planned questions were completed for all groups.

The researcher was not able personally to recruit the participants from the study, as the selection procedure of participants was co-ordinated by the hospital's management. Although the hospital managers used the primary selection criteria (registered professional nurses in paediatric wards), evidence from feedback from participants indicated that there may have been limited pre-interview preparation of the participants. For example, some participants did not know what the research was about, implying that a full process of consent had not been followed in their case. To rectify this, the researcher provided a research overview to all participants and obtained written consent according to accepted ethical standards.

5.5   SUMMARY OF FINDINGS

There were predominant factors identified that increase the risk of staff not being able to detect clinical deterioration in children nursed in paediatric wards. These included the problem of staff shortages, gaps in training, lack of ICU beds, sicker patients in the wards, lack of equipment, and inexperienced staff.

Conversely, it was reported that the following factors can or would assist in staff being able to detect clinical deterioration in children nursed in paediatric wards: employing more staff,

more effective management of training opportunities on resuscitation and clinical deterioration, increased quota of ICU beds and accompanying staff, and adequate monitoring and emergency equipment in the wards.

An additional factor that was reported consistently was the fact that teamwork among nursing staff and other medical professionals, as well as parental involvement in the care of the children, assisted staff in being able to detect clinical deterioration in children nursed in their wards.

Problems such as shortages of staff and ICU beds, and increased acuities of patients nursed in paediatric wards by inexperienced staff, appear to be a global concern. To ameliorate these problems and to augment the quality of care provided under difficult structural limitations, early warning systems (EWS), outreach programmes and dedicated medical response teams have been implemented globally with significant success.

5.6   RECOMMENDATIONS

The recommendations are presented in accordance with the findings that emerged from the study.

5.6.1   AVAILABILITY OF INFRASTRUCTURE, STAFFING AND EQUIPMENT

Predominant factors identified that increased the risk of staff not being able to detect clinical deterioration in children nursed in paediatric wards included the problem of staff shortages, lack of ICU beds, sicker patients nursed in the wards and lack of equipment. The recommendations to deal with these factors require a management strategy to:

- Ensure staffing levels that meet the benchmarked South African provincial/national standards for the specified level of care in order to treat and manage patients appropriately. Vacant staff posts should be advertised and filled as soon as possible.
- Should ensure the efficient use of staff according to acuity levels, bed occupancy and should plan for sufficient cover on night duty, weekends and while staff are on lunch breaks or involved in training.
- Ensure that sufficient equipment is available and is appropriately placed for the treatment of patients at the specified level of care.

- It would be beneficial (as was suggested by participants in this study) if a system could be put in place where they could determine 'at a glance' whether their equipment had been serviced/calibrated or when it was due to be serviced/calibrated.
- Due to the shortage of ICU beds, hospital management should ensure that the high care areas in paediatric wards are adequately equipped and staffed to deal with severely ill children.

These recommendations are in line with the South African Department of Health's National Core Standards (2011:21-27) which were developed in order to establish expected minimum standards conducive to quality care in South African health establishments. These recommendations are also in line with recommendations that have arisen from the analysis of data collected by the child healthcare problem identification programme in South Africa (Saving Children 2009 Report, 2011:23).

5.6.2   QUALITY ASSURANCE

Predominant areas identified by participants relating to the evaluation of care that patients received in hospital included peer discussion and feedback, Morbidity and Mortality reviews, and audits to ensure adherence to policies and procedures. However, one of the challenges was that it was not always possible for staff to participate in feedback and patient reviews due to staff shortages or work constraints.

The following recommendations to deal with these factors identified are related to improving the clinical quality of care:

- The formulation of a quality assurance committee/programme that includes a nursing staff member from all disciplines. The purpose of such a programme would be to firstly, review policies and ensure compliance to policies and procedures through monthly clinical audits, secondly, evaluate audit results to identify quality failures and, thirdly, highlight aspects of high risk areas and discuss remedial action.
- Participation from the multidisciplinary team needs to be encouraged at the regular Mortality and Morbidity (M and M) meetings that reviews in-hospital deaths. As these meetings provide quality improvement measures and professional feedback it is recommended that all nursing staff involved with the patients for review, not only the sister in charge of the unit, are given the opportunity to attend these meetings to ensure feedback and learning takes place.

5.6.3   TRAINING

The findings in this study suggest that there are numerous challenges regarding training and more specifically training pertaining to detection of clinical deterioration in children nursed in wards and resuscitation training. The recommendations to deal with these factors include the following:

- Hospital management is to ensure that all health professionals dealing with children are assessed as competent by a designated clinical team to identify and manage key conditions that account for the most deaths in children relevant to the South African disease profile.
- The appointment of dedicated mentors per discipline in the hospital to facilitate continued learning opportunities for nurses at the bedside and to promote quality improvement initiatives.
- An ongoing, formalised in-service training programme is in operation to equip all staff (including night staff) with the necessary skills and competencies to deal with children with an increased level of severity of illness. This programme should be run by a designated clinical team to ensure the standardisation of the content of the training.
- Hospital management is to ensure that all categories of nursing staff attend Basic Paediatric Life Support (BPLS) courses every four years as per hospital policy or as per the resuscitation council of South Africa's policy of every two years depending on the type of resuscitation course provided.
- As well as a BPLS programme, the implementation of a monthly bedside CPR booster training programme is recommended in order to keep recognition of serious illness/deterioration and resuscitation skills updated for all staff.

5.6.4   POLICIES AND GUIDELINES

Participants reported that the availability of policies and guidelines (in the form of age-appropriate vital signs reference charts) varied from ward to ward in the research setting. Pertaining to guidelines and policies the recommendations are as follows:

- Hospital management in conjunction with a designated clinical team are to ensure that all policies are updated/reviewed at least every two years and that they are accessible to all staff in all ward/units.

- All paediatric wards and facilities that treat children are to ensure that standardised guidelines in the form of age-appropriate vital signs reference charts are available in all patients nursing files and/or treatment areas, clearly visible for ease of reference.

5.6.5   FUTURE RESEARCH

Recommendations for future research include the following:

- Research in other South African hospitals with dedicated paediatric wards using a similar research methodology could attest to the generalisability of this study's findings.
- An investigation into retention strategies to address attrition rates and thus improve the nursing staff compliment in South African hospitals and specifically to improve the compliment of staff in speciality areas, for example, paediatric and ICU nursing.
- An investigation into whether assigned paediatric acuities are still relevant in a South African context in the light of the burden of disease and disease profile in our country.
- To conduct a cost-benefit-analysis to assess the training required to implement a paediatric 'early warning system' in South African public hospitals.

5.7   FINAL CONCLUSION

By examining nurses' perceptions with regard to recognition of clinical deterioration of children nursed in paediatric wards, this study discovered factors that hindered and facilitated recognition of clinical deterioration. There are numerous structural influences that can hinder staff's ability to recognise clinical deterioration, namely, lack of ICU beds and correspondingly lack of appropriate equipment in the wards; sicker children are being nursed in paediatric wards, which increase nurses' workloads in wards. The process or method of nursing delivery is also a category of influencing factors. Significant examples in this category include the presence of teamwork among nursing staff, including doctors and other allied professionals; teamwork appears to have a positive contribution to the staff's ability to recognise clinical deterioration. Another example in this group has to do with parental involvement; constructive parental participation assists staff in being able to recognise clinical deterioration. An important theme that emerged relates to training: it was felt that more effective management of training opportunities related to resuscitation and clinical deterioration was needed. In addition, the data indicated that a PEWS tool would be beneficial in assisting staff to recognise clinical deterioration.

This study has provided very relevant information with regard to experiences of registered professional nurses working in paediatric wards in South Africa. The credibility of the data is confirmed by the wide range of supporting literature on the topic.

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APPENDICES

APPENDIX A: Ethics approval letter

UNIVERSITEIT·STELLENBOSCH·UNIVERSITY
jou kennisvennoot • your knowledge partner

07 February 2011   **MAILED**

Mrs S Wortley
Department of Nursing
2nd Floor
Teaching Block

Dear Mrs Wortley

Nurses knowledge and clinical practice in their recognition of unexpected deterioration in children.

ETHICS REFERENCE NO: N10/11/399

RE : APPROVAL

It is a pleasure to inform you that a review panel of the Health Research Ethics Committee has approved the above-mentioned project on 24 January 2011, including the ethical aspects involved, for a period of one year from this date.

This project is therefore now registered and you can proceed with the work. Please quote the above-mentioned project number in ALL future correspondence. You may start with the project. Notwithstanding this approval, the Committee can request that work on this project be halted temporarily in anticipation of more information that they might deem necessary.

Please note a template of the progress report is obtainable on www.sun.ac.za/rds and should be submitted to the Committee before the year has expired. The Committee will then consider the continuation of the project for a further year (if necessary). Annually a number of projects may be selected randomly and subjected to an external audit.

Translations of the consent document in the languages applicable to the study participants should be submitted.

Federal Wide Assurance Number: 00001372
Institutional Review Board (IRB) Number: IRB0005239

The Health Research Ethics Committee complies with the SA National Health Act No.61 2003 as it pertains to health research and the United States Code of Federal Regulations Title 45 Part 46. This committee abides by the ethical norms and principles for research, established by the Declaration of Helsinki, the South African Medical Research Council Guidelines as well as the Guidelines for Ethical Research: Principles Structures and Processes 2004 (Department of Health).

Please note that for research at primary or secondary healthcare facility permission must still be obtained from the relevant authorities (Western Cape Department of Health and/or City Health) to conduct the research as stated in the protocol. Contact persons are Ms Claudette Abrahams at Western Cape Department of Health (healthres@pgwc.gov.za Tel: +27 21 483 9907) and Dr Hélène Visser at City Health (Helene.Visser@capetown.gov.za Tel: +27 21 400 3981). Research that will be conducted at any tertiary academic institution requires approval from the relevant hospital manager. Ethics approval is required BEFORE approval can be obtained from these health authorities.

Approval Date: 24 January 2011   Expiry Date: 24 January 2012

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Verbind tot Optimale Gesondheid · Committed to Optimal Health
Afdeling Navorsingsontwikkeling en -steun · Division of Research Development and Support
Posbus/PO Box 19063 · Tygerberg 7505 · Suid-Afrika/South Africa
Tel.: +27 21 938 9075 · Faks/Fax: +27 21 931 3352

Yours faithfully

MS CARLI SAGER
RESEARCH DEVELOPMENT AND SUPPORT
Tel: +27 21 938 9140 / E-mail: carlis@sun.ac.za
Fax: +27 21 931 3352

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APPENDIX B: Amended ethics approval letter

UNIVERSITEIT·STELLENBOSCH·UNIVERSITY
jou kennisvennoot · your knowledge partner

08 July 2011   **MAILED**

Mrs S Wortley
Department of Nursing
2nd Floor
Teaching Block

Dear Mrs Wortley

Nurses knowledge and clinical practice in their recognition of unexpected deterioration in children.

ETHICS REFERENCE NO: N10/11/399

RE : AMENDMENT

Your letter received 27 June 2011 refers.

The Chairperson of the Health Research Ethics Committee approved the amended documentation in accordance with the
authority given to him by the Committee.

The following amendments were approved:
1. Changes to the protocol.

Yours faithfully

MRS MERTRUDE DAVIDS
RESEARCH DEVELOPMENT AND SUPPORT
Tel: 021 938 9207 / E-mail: mertrude@sun.ac.za
Fax: 021 931 3352

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APPENDIX C: Hospital research approval

DEPARTMENT of HEALTH
Provincial Government of the Western Cape

Red Cross War Memorial Children's Hospital

Tblake@pgwc.gov.za
Tel: +27 21 658 5788: fax: +27 21658 5166
Klipfontein Rd, Rondebosch, 7700
Private Bag X5, Rondebosch, 7701

REFERENCE: RESEARCH
ENQUIRIES: Dr. TA BLAKE

SUZANNE WORTLEY R/N

32 Meerlust

Pinelands

Dear Mrs Wortley,

RESEARCH REQUEST

Your new proposal to do research at the Red Cross War Memorial Children's Hospital has been approved.

Sorry for the delay. We hope you have success in this venture.

Yours faithfully,

DR T A BLAKE
CHAIRPERSON
HOSPITAL RESEARCH REVIEW COMMITTEE

23 August 2011
DATE

APPENDIX D: Participant information Leaflet and Consent Form

PARTICIPANT INFORMATION LEAFLET AND CONSENT FORM

TITLE OF THE RESEARCH PROJECT:

Perceptions and experiences of registered professional nurses in the recognition of unexpected clinical deterioration in children in wards

REFERENCE NUMBER:

PRINCIPAL INVESTIGATOR: Suzanne Wortley

ADDRESS: 32 Meerlust
          Pinelands
          Cape Town

CONTACT NUMBER: (W) 021-4806421
                 (C) 0824671304

You are being invited to take part in a research project. Please take some time to read the information presented here, which will explain the details of this project. Please ask the study staff any questions about any part of this project that you do not fully understand. It is very important that you are fully satisfied that you clearly understand what this research entails and how you could be involved. Also, your participation is **entirely voluntary** and you are free to decline to participate. If you say no, this will not affect you negatively in any way whatsoever. You are also free to withdraw from the study at any point, even if you do agree to take part.

This study has been approved by the **Committee for Human Research at Stellenbosch University** and will be conducted according to the ethical guidelines and principles of the international Declaration of Helsinki, South African Guidelines for Good Clinical Practice and the Medical Research Council (MRC) Ethical Guidelines for Research.

What is this research study all about?
- The study is being conducted at Red Cross War Memorial Children's Hospital.
- The purpose of the study is to establish registered professional nurse's perceptions and experiences of their clinical practice in the recognition of

unexpected clinical deterioration in children nursed in paediatric wards. The findings of the study could determine whether a formal guideline to assist nurses in the early recognition of clinical deterioration in children would be beneficial.

- You are requested to attend a focus group interview for the purpose of this study.

Why have you been invited to participate?

- You as a registered professional nurse working in a general paediatric ward, experience occurrences of unexpected clinical deterioration in children.
- Your perceptions and experiences of these occurrences in your clinical practice is requested in order to establish best practice guidelines in order to optimise patient care.

What will your responsibilities be?

- Your responsibility will be to complete the attached consent form and to attend a focus group interview comprising four participants in each group and lasting about one hour.

Who will benefit from taking part in this research?

- The nurses involved in the recognition of clinical deterioration in children nursed in general paediatric wards and ultimately the patients they care for.

Are there any risks involved in your taking part in this research?

- There are no risks or discomfort involved in participating in the focus group interviews. Your privacy, confidentiality and anonymity are guaranteed.
- All interview transcripts obtained from the focus group interviews will be regarded as confidential. The results will be published or presented in such a fashion that you, as the respondent and employee, will remain unidentifiable.

If you do not agree to take part, what alternatives do you have?

- You may at any time withdraw or not participate at all in this study and you will not be discriminated upon.

Will you be paid to take part in this study and are there any costs involved?
- No, you will not be paid to take part in the study. There will be no costs involved for you, if you do take part.

Is there any thing else that you should know or do?

- This study involves participating in a focus group interview where all participant's contributions will be respected and kept confidential.

Declaration by participant

By signing below, I …………………………….…………. agree to take part in this research project entitled "Perceptions and experiences of registered professional nurses in the recognition of unexpected clinical deterioration in children in wards".

I declare that:

- I have read or had read to me this information and consent form and it is written in a language with which I am fluent and comfortable.
- I have had a chance to ask questions and all my questions have been adequately answered.
- I understand that taking part in this study is **voluntary** and I have not been pressurised to participate.
- I may choose to leave the study at any time and will not be penalised or prejudiced in any way.

Signed at (*place*) ....…......……………….. on (*date*) …………...……….. 2011

....
Signature of participant   **Signature of witness**

Declaration by investigator

I *(name)* …………………………………………..……… declare that:

- I explained the information in this document to …………………………………..
- I encouraged him/her to ask questions and took adequate time to answer them.
- I am satisfied that he/she adequately understands all aspects of the research, as discussed above
- I did/did not use an interpreter. (*If an interpreter is used then the interpreter must sign the declaration below.*

Signed at (*place*) ....…......……………….. on (*date*) …………...……….. 2011

....
Signature of investigator   **Signature of witness**

APPENDIX E: Interview guide questions

Interview Guide: Proposed questioning route based on the objectives

Opening Question:-
- Tell us in which area/ward you work in and how long you have been working there?
- How long have you been registered as a professional nurse?

Introductory questions:-
- Tell us about some of your positive experiences of working in a leading academic children's hospital.
- In your opinion or experience, do you think there are sicker patient's being nursed in children's wards compared to in previous years and why do you think this is?
  - Tell us about some of the problems of having to nurse sicker patients in the wards.

Transition questions:-
- What do the words "clinical deterioration in a child" mean to you?

Key questions:-
- How easy is it to recognize clinical deterioration of a child nursed in the wards before the child arrests?
  - What helps you to recognize clinical deterioration
  - What are the things that make it difficult to recognize clinical deterioration
  - Are there limitations in the current monitoring system
- Tell us about a call procedure or a protocol that is in place in the wards if a child's condition is deteriorating
- What is the nursing management of a child whose condition deteriorates in the ward?
- In your experience, what is the % rate of survival once a child arrests in the wards?
- If you had unlimited resources, as an RN working in the wards, what systems would you put in place in order to assist you in recognizing a child's condition deteriorating? (budget, staff, ICU beds, monitors)
- Tell about a hospital resuscitation course that you have been on and how long ago was the course?
  - Tell us about any aspects of the course that could assist you with being able to recognize a child's condition deteriorating and the management thereof
  - Besides the resuscitation course, are there any other training opportunities in the hospital with regards to recognition and management of a child whose condition is deteriorating

Ending questions:-
- In your opinion, would a formal guideline based on a patient's vital signs that could help you in the recognition of clinical deterioration be beneficial to you?

Closure: Have we missed anything? Recap?