



Skin injury prevention in an Irish neonatal unit: An action research study

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SKIN INJURY PREVENTION IN AN IRISH NEONATAL UNIT: AN ACTION
RESEARCH STUDY

ABSTRACT

Aim: This study aimed to improve skin assessment and skincare practices for neonates in a regional neonatal setting in Ireland by the implementation of the Neonatal Tissue Viability Risk Assessment Tool.

Method: A qualitative participatory action design was used. Following the introduction of the Neonatal Tissue Viability Risk Assessment Tool into the neonatal unit, three focus groups with nurses (n=17) were held. The focus group data was analysed using thematic analysis.

Results: Neonatal nurses acknowledged the need for change regarding the prevention of neonatal skin injuries. Variations in skincare practices were found and a need for standardised care was highlighted. Implementation of the skin risk assessment tool helped to raise awareness, standardise practice and improve documentation and communication.

Conclusion: Implementing a skin risk assessment tool into neonatal units in Ireland together with evidence-based skincare guidelines and staff education could result in the reduction of skin injuries in these infants.

KEYWORDS

Skin risk assessment tool, neonates, neonatal intensive care unit, nursing, action research, skin injury, neonatal pressure ulcer

Introduction

Skin injury prevention for premature infants is an aspect of nursing care that can be overlooked in the busy adrenaline powered environment of the Neonatal Intensive Care Unit (NICU). Technological advances in neonatal and maternal care such as the provision of antenatal steroids, improvements in ventilation methods and surfactant therapy have enabled infants to survive at the cusp of viability where skin is extremely immature and vulnerable to breakdown (Saigal and Doyle, 2008). As a result, nurses are presented with new challenges in their management of skin injuries in the NICU (August *et al.* 2014). Skin injuries continue to occur in neonatal healthcare settings despite the majority being preventable (Vance *et al.*, 2015). Prevalence rates of as high as 23% (Baharestani and Ratliff, 2007) and incidence rates of 16% (Fujii *et al.*, 2010) in NICUs have been reported. A neonatal skin injury is devastating for parents and can result in potential scarring, a longer hospital stay and increased hospital costs (Vance *et al.*, 2015). Moreover, they contribute to an increased risk of infection which is the major cause of infant morbidity and mortality in the NICU (Visscher, 2014). Despite this, a lack of effective treatments for neonatal skin injuries exist due to the ethical constraints associated with testing products on premature infants' skin (Franck, 2005; August *et al.*, 2014). Prevention is therefore central to the management of these injuries and the implementation of a skin risk assessment tool into Irish NICUs could help to address this issue (Scheans, 2015). The benefits of the implementation of a skin risk assessment tool has been highlighted internationally in neonatal units in America, the United Kingdom and Australia as healthcare professionals are becoming increasingly aware that prevention of neonatal skin injuries is an area of clinical practice that could be improved

(Huffines and Lodgson, 1997; McGurk *et al*, 2004; Ashworth and Briggs, 2011, Dolack *et al*, 2013; Schumacher *et al*, 2013; August *et al*, 2014; Vance *et al*, 2015).

STUDY AIM

This study aimed to improve skin assessment and skincare practices for neonates in a regional neonatal setting by assisting nurses to create change to their practice through the implementation of a skin risk assessment tool. The setting for this study was a Level 2 regional NICU in Ireland. The level 2 NICU offers all modern medical interventions to premature and ill neonatal infants including all forms of ventilation and nitric oxide therapy and point of care echo-cardiology. The NICU has 14 beds to meet current demand for the service. The beds capacity includes 4 intensive care cots, 4 high dependency cots and 6 special care cots.

METHOD

This study utilised a Participatory Action Research approach. Action Research is grounded in a participatory worldview and originates from the concept of critical social theory (Koshy *et al*, 2011). Critical social theory claims that people can reflect on situations and through the research process could effect change (Kelly and Simpson, 2001). The aim of Action Research is to take action, change practice or to generate or refine a theory (Coghlan and Casey, 2001; Coghlan and Brannick, 2005; Koshy *et al*, 2011). Participatory Action Research was chosen because the aim of this study was to investigate real life practices with the purpose of understanding and improving practice and quality of neonatal care

(Kemmis and McTaggart, 2008). Ethical approval for the study was granted by the Hospital's ethics committee.

Action research involves a number of phases. This study had four phases (Figure 1). FIGURE ONE HERE

Phase 1- diagnosing

A theory-practice gap in relation to neonatal skin assessment was identified through a review of the literature which revealed that neonatal units internationally use skin risk assessment tools to assess infants' skin and standardise practice. However, a skin risk assessment tool was not in use at the neonatal unit where this study took place.

Phase 2- planning action

In the planning phase, all available neonatal skin risk assessment tools were considered for implementation. Of the limited neonatal tools available most have not been validated (Vance *et al*, 2015). However, the Braden Q scale has been tested for reliability and validity in paediatrics and Noonan *et al* (2011) "*feel the BradenQ Scale can be used in the neonatal population until a valid and reliable neonatal pressure ulcer risk assessment tool is developed*" (Noonan *et al*, 2011, p.573). The Neonatal Tissue Viability Risk Assessment Tool (Figure 2) is based on the Braden Q scale and has been adapted for use with the neonatal population. Furthermore, it is currently being used in a large tertiary neonatal unit in the United Kingdom (Ashworth and Briggs, 2011). Therefore, this tool was

deemed the most appropriate. Consultations with key experts attached to the unit (2 Neonatologists, an Advanced Neonatal Nurse Practitioner, a Clinical Nurse Manager, an experienced neonatal nurse and a Tissue Viability Nurse) took place before selecting this tool for this study. This was in order to establish content validity of the tool and ensure the tool was appropriate for use in an Irish neonatal unit (Knoos and Ostman, 2010). The tool was then selected and permission to use the tool for this study was given by the copyright owners.

FIGURE 2 HERE the tool.

Prior to the introduction of the tool, presentations to all the neonatal nurses on the unit were provided over a two month period by the first author. The presentations focused on the purpose of the study and the education on using the assessment tool. A specially designed education package for nurses was also developed and left at the nurses' station for nurses to consult as required.

Phase3- taking action

The third phase of the action research study involved implementation of the assessment tool into the NICU. Following a three month implementation period, records of assessments were reviewed. The total number of skin assessments on neonates undertaken by nurses over the three month time period totalled 308. A total of 90 infants (84.9%) out of a possible 106 were assessed using the tool. The infants were assessed once on admission to obtain a baseline score and then scored thereafter according to their risk of skin breakdown. Infants scoring 20 or over were considered 'very high risk' and were assessed twice daily, infants who

scored between 11 and 19 were considered 'high risk' and assessed daily, infants scoring between 6 and 10 were considered 'at risk' and assessed twice weekly and infants scoring 0 to 5 were considered 'low risk' and assessed weekly.

Phase 4- evaluating action

The final phase of the study evaluated the implementation of the risk assessment tool. Three focus groups with neonatal nurses on the unit were undertaken three months after introducing the tool. Purposive sampling was used to recruit participants for 3 focus groups. A total of 17 nurses out of a sample of 27 nurses were recruited for the focus groups. Inclusion criteria stipulated that nurses had at least 5 years clinical experience of neonatal care and had used the skin risk assessment tool in practice. The rationale for these inclusion criteria was that the researchers wanted to recruit participants with expert knowledge on the research topic and on the area of practice. Most models of expertise highlight that a minimum of 5 years of practical experience is needed for to become an 'expert' (Benner, 1984). In addition, participants needed to have used the tool in practice so that they would be able to give their opinions and suggestions on how the tool could be improved. The inclusion criteria excluded 2 nurses, one who had less than 5 years experience and one who had not used the tool in practice. Also, one nurse from this sample was selected for the role of assistant moderator for the focus groups. Participants were provided with an information sheet on the purpose and nature of the study and gave written consent (An Bord Altranais, 2007). Participants were informed that they could withdraw from the study at any time and verbal consent was re-established from participants before the focus groups

commenced. A semi structured approach and a topic guide comprising of open ended questions was used for the focus groups.

Data analysis of focus groups

Thematic analysis described by Braun and Clarke (2006) was used to analyse the discussions that evolved in the focus group interviews. Audiotapes were transcribed verbatim. Participants were given code numbers and any identifying information was deleted. Transcripts were re-read several times whilst listening to the audio recordings. Data was coded manually and codes were grouped together in order to search for themes. Thematic maps helped to identify themes and a thematic table was used to organise data. Themes and sub-themes were defined and named.

FINDINGS

The findings of this study were categorised into four themes. The first theme identified was 'the need for change' where findings highlighted that variations in practice exist and there is a need for standardised skin assessment in the neonatal unit. The second theme identified was 'improving skincare practices' where nurses felt that the implementation of the tool raised awareness and provided nurses with a more comprehensive skin assessment. The third theme identified was 'accountable nursing care' where nurses felt the tool improved documentation and improved communication with the multidisciplinary team. The last theme identified was barriers to change that discussed the subjectivity of the tool and the theory practice gap.

The need for change

The neonatal nurses acknowledged the problem of skin injuries in the NICU and all participants across the 3 focus groups had experience of many types of skin injuries observed in clinical practice.

FG3P4: "... in the past we've actually seen necrosed tip of ears..."

Participants further discussed the severity of some skin injuries that they had encountered and reflected whether more could be done for infants with skin injuries. Participants felt strongly that a change in practice was required and were able to identify areas of improvement that could be examined to improve care.

FG3P1: "I'm not sure if we're doing enough for the babies with the really bad ventouse marks, bruising, broken skin. Imagine the pain we'd have if we had that on our heads, I know we give Calpol but are we doing enough for them..."

FG3P5: "...that's the other area is the nasal area with all the prongs and the CPAP's and SIPAP's, now we do obviously we do check em on a regular basis, but I mean its its its they're not not great, we could come up with something better"

Many participants throughout the three focus groups identified that variations in practice existed with regards to skin assessment and skincare within the neonatal unit and also nationally and internationally in neonatal units where the participants previously worked.

FG3P3: "I just find everyone has their own ideas of what you should be doing and everyone does it a bit different..."

In particular, participants discussed variations in practice with regards to the use of tapes, dressings and skincare products and felt frustrated by a lack of continuity of care in practice. Participants from one focus group expressed concerns that mothers were bringing in their own skincare products into the neonatal to use on their infant's skin which may not be suitable for premature infants. These views are illustrated in the following narratives:

FG3P3: "...everyone seems to have a different idea what to do when you have a sore bottom..."

FG3P4: "if someone puts on Sudocrem followed by Vaseline, the next person will do opposite"

FG1P2: "...even mothers bringing in their own."

Discussions surrounding variations in practice were followed by participants highlighting the need for standardised care in relation to skin assessment and skincare practices. It was also highlighted in the focus groups that skincare practices should be standardised across all NICUs in Ireland:

FG1P5: "I just think that nationally actually it could be assessed in every unit and then see where were coming from"

Participants expressed strongly that the implementation of the skin risk assessment tool into clinical practice helped provide an initial assessment of infants' skin on admission and set a standard to ensure infants' skin integrity was maintained.

FG2P3: "I think it's a good baseline when it's done so short within admission or at admission that you get a baseline on the baby and you know what to look out for then".

FG3P3: "I suppose it just brought it to your attention to be aware of the skin, like we have nothing standardised, but by doing this you were very conscious of looking at the skin, and looking to see you know when is the next skin assessment due and you kinda had a standard to go by if there was any anything, I just felt it brought it to your attention more and you were more conscious of it"

FG1P4: "yeah and if it is good to start that's the way you want to keep it isn't it yeah so you've got that standard" (page 2, line 63-64).

However, the majority of participants expressed the need for more guidance in relation to skincare and felt frustrated by a lack of guidelines to direct practice. Participants expressed the urgent need for the development of a skincare guideline to accompany the tool in order to reduce ritualistic practices and standardise care.

FG2P1: "this is just the assessment tool but it needs to be accompanied by a guideline"

Improving skincare practices

The nurses agreed that the implementation of the skin risk assessment tool helped to improve skin assessment in the neonatal unit. Participants talked about how the implementation of the tool had helped raise awareness of the issues regarding neonatal skin injury and nurses' recognised that this is an area of their practice that could be improved.

FG1P4: "...its just for me such an eye opener how big an issue it is..."

FG2P2: "it does make you more aware of the importance of checking the baby's skin..."

Implementation of the tool has also raised awareness of the skin injuries that term infants can encounter that sometimes can be overlooked:

FG2P2: "I wouldn't really think about using it on a well, erm even a preemie that's out in a cot... I suppose maybe that's not right cos they can get excoriated necks and sore bottoms an that, but I suppose I hadn't thought about that until somebody brought it up today" .

Many participants felt that the skin risk assessment tool helped them to provide a more comprehensive skin assessment. Participants frequently identified that they liked the idea of having a skin assessment tool and thought that it would improve quality and care for neonates.

FG2P5: "I think it was a really good tool to use on the unit as part of the holistic care of the infants, it will definitely improve outcomes and quality."

FG3P5: "it made it more methodical, and that everybody was kinda on the same page they were looking for the same issues or same problems that might of come up."

One participant was able to identify an infant 'at risk' and implemented preventative measures as a result of using the tool:

FG3P5: "...the baby wasn't able to move himself as freely as he should do, I identified that by reading this that actually maybe we should put something extra underneath the mattress to give him a little bit more padding" .

However, one participant expressed the view of being able to identify an infant 'at risk' of skin breakdown from experience and queried if an assessment tool is really needed:

FG2P2: " I mean a baby of less than 28 weeks is really high risk anyway, you should know that really without having to go through all this shouldn't we?"

In addition, a few participants found the skin risk assessment tool complicated to use:

FG2P2: "...it can be slightly complicated initially"

Accountable nursing care

Although skin assessment and skincare was carried out on the NICU, it was evident that standardised documentation was lacking. Participants felt strongly that the implementation of the tool improved documentation and accountability.

FG1P2: "It's documenting exactly how the skin is on such and such a date" .

FG1P4: "we certainly need to be examining and recording that every day to say that we've checked it" .

Some participants found that by using the tool helped them assess whether the infant's skin and/or skin injury was improving or not.

FG2P1: "I found it good when I assessed for the TPN burn on two occasions I could see the difference you know in the healing of the skin and the things I wrote down" (page 3, line 89-91).

FG3P3: "...to see if it was improving and what was it like the day before ...that we can see that there was an improvement in it cos I hadn't seen it before so I didn't know what it was like" .

A few participants discussed using the skin assessment tool for audit purposes as a way of improving practice.

FG1P6: "could use it as a kinda semi audit thing so we can pick up then what it is causing any problems and then maybe change it".

FG3P3: "it allows you to look back and see what issues there are in the unit regarding the skin..... you could nearly audit it and see, ok we have a problem with drips tissing or we have a problem

with sore bottoms, but why have we?..... it gives you like a little audit tool to say d'you know there's a load of babies showing up here, what are we doing wrong

Workload pressures were a factor on whether skin assessments were documented. Concerns were expressed regarding having enough time to document the skin assessments and it was evident that some skin assessments were not documented if the NICU was busy and nurses were under pressure.

FG3P2: "... we're all thinking god another piece of paper"

FG3P1: ".. that's so true [not documenting assessment], especially when you're very busy doing an admission" .

However, most participants highlighted that verbal handovers can be unreliable and effective documentation could in fact save time in clinical practice. Participants highlighted that the implementation of the skin risk assessment tool provided documentation in one designated form and evidence of the progress of an infant's skin injury was clear.

FG2P3: "...I found for documentation that all the information is together on the yellow sheet, whereas before we had to sift through the Kardex to find out what was happening with the skin problem on a particular baby..."

FG3P1: "if you come back from a week off night duty you can read what's been happening, you mightn't be verbally told what's happened in a whole week somebody can't give you the history on a baby for the seven days you've been gone, and if its documented on the back of this you can read up and see how it is, and see how its been going and if its improving or dis-improving."

Many participants felt that the presence of the skin risk assessment tool improved communication between nursing staff and members of the multidisciplinary team.

FG3P1: "...for TPN burns plastics got called over to see this baby, what did the plastics consultant have to say, that's of vital importance, it could be documented on the skin care plan, and what he advised and what dressings he advised and when he's gonna see the baby again."

However, some participants identified that information regarding an infant's skin assessment was only helpful if it was communicated to the next member of staff.

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FG3P5: "... it was only as good as if it was passed on from person to person."

FG3P2: "and I think it's almost sometimes it's almost like we get a bit blasé about, you do look, but you don't write it anywhere or say anything" (page 8, line 244-245).

Barriers to change

Although the majority of nurses felt that the skin risk assessment tool was useful, many raised issues they experienced when using the tool in their practice. Many participants discussed how they would like to provide effective skincare practices but sometimes in practice this is not always possible. Some participants explained the dilemma of prioritising care needs in the NICU.

FG3P5: "...or because they're ill you're trying to leave them as long as possible so you have to try and remember to move them so that their areas don't break down" .

FG3P3: "...especially the ones that are sedated and sick they're the most at risk yeah and you're on about minimal handling but at the same time you can't avoid the skincare."

Another participant identified that an infant needed regular repositioning when using the tool in practice. However, this was not possible as the infant was having procedures done by medical staff.

FG3P2 "... 2-4 hourly repositioning but I couldn't get at him cos he was having procedures done"

Participants reflected on the use of skin risk assessment tool in practice to assess infants' skin and some participants felt that the tool to be subjective.

FG3P5: "...it's a little bit subjective, and each person will give their little bit so like that one day a baby might score higher than the next because the next person might think well actually he's quite active, but its personal opinion that..."

FG1P3: "I think your perception could be different to mine"

One participant expressed difficulty in assessing the skin of an infant due to the phrasing on the tool was worded and may have been scoring incorrectly because of this:

FG1P2: "...well I think it could be worded better"

Overall the participants thought the idea of the assessment tool was good, however several participants across the three focus groups identified that not every baby fitted into every criteria.

FG2P5: "and maybe there is some room for errors not every baby fits into each criteria"

FG1P4: "but even in terms of babies who are well and feeding might get a very low score out of this tool, but yet have got a rip roaring sore bottom because of the milk they're on"

Participants suggested that more education and further training on the tool is needed so nurses are scoring each infant similarly.

FG1P4: "yeah, with a lot of education I guess so that we're all doing it in the same way."

DISCUSSION

Evidence from this study confirms that of previous studies where variations in skincare practices continue to exist in neonatal units (Kuller, 2001; Jackson, 2008). However, standardised skincare guidelines in the US have been reported to result in improved skincare practices and staff knowledge, leading to high quality of care for neonates (Lund *et al*, 2001a; Lund *et al* 2001b). In addition, while NICE has provided direction in the development of protocols and evidence based guidelines, neonatal care specific guidelines on skincare are not available (Smith and Donze, 2009; Teasdale *et al*, 2009). The development of national skincare guidelines in Ireland would help to avoid inconsistent parental advice and variations in practice not only in individual neonatal units but also when an infant is transferred from one hospital to another.

Findings from this study also concur with those reported by Ashworth and Briggs (2011) who reported the implementation of a skin risk assessment tool assisted nurses in their provision of a comprehensive skin assessment in clinical practice. Participants felt that the implementation of the tool helped to raise awareness of the issue. This is consistent with research in the United States where the 'Neonatal Skin Care Project' has been successful in educating staff and raising national awareness of neonatal skincare (Johnson and Maikler, 2001).

Accountability is a vital part of nursing practice especially within the area of tissue viability and skin integrity (Baranoski and Ayello, 2012). Registered nurses are accountable for their practice and the care they provide to patients (Nursing and Midwifery Board of Ireland, 2014).

Similar to findings of this study, other healthcare environments have reported inconsistent documentation and lack of a standardised approach to assessment and documentation (Gartlan *et al*, 2010; Law *et al*, 2010; O'Brien and Cowman, 2011; Parnham, 2011). Poor documentation leaves nurses open to potential litigation and has implications for the safety of patients (An Bord Altranais, 2002; O'Brien and Cowman, 2011). The majority of participants in this study found the presence of a skin risk assessment tool improved accountability through the accurate documentation of the date and time of assessment, observation of skin and action taken. Effective record keeping and documentation of skin assessments and action taken can improve accountability for nurses by providing evidence that a service has been delivered (Gethin, 2006). Previous research reporting the implementation of assessment tools into practice also found improved documentation and quality of care (Parnham, 2011; Shephard and Nixon, 2013; Lamburne, 2015). Other research similarly suggests that documentation improves patient care through accurate recording of wound healing and treatment as well as improved communication between healthcare professionals (Gethin, 2006; Prideaux, 2011; Beach and Oates, 2014).

However, the findings reported here also mirrors previous research that has shown assessment tools can be subjective and open to individual interpretation. Complicated risk assessment scales can result in some nurses using the tool incorrectly, meaning some nurses may give the same patient a different score. (Kelly, 2005; Fletcher, 2007; Cook, 2011; Vance *et al*, 2015). Cook (2011) states that assessment can be difficult and subject to individual interpretation based on nurses' knowledge and experience and suggests training of staff and use of the tool on a regular basis is essential in reducing subjectivity. Implementing a skin

risk assessment tool into clinical practice requires “a *strategic plan that includes creating system supports, an educational rollout plan and a monitoring and feedback system*” (Noonan et al 2011, p.9). Other research however suggests clinical judgement may be more effective at assessing risk than the use of a risk assessment tool (Pancorbo-Hidalgo et al, 2006; Ousey and Cook, 2011; Kottner et al, 2013).

Limitations

This study has a number of limitations. Firstly, the study was small in scale and undertaken at a single neonatal unit. Use of multiple sites would be needed to strengthen the findings reported here. The first author, as an ‘insider’ was well known to participants and participants also knew each other well. Acquaintanceship can be problematic in focus groups as group dynamics may be affected and participants may withhold opinions (Plummer-D’Amato, 2008).

CONCLUSION

This study adds to the growing body of knowledge on the implementation of a skin risk assessment tool in neonatal care settings. The findings suggest that introducing a risk assessment tool can improve skin assessment and skincare practices for neonates. Moreover, the findings suggest that skin risk assessment tools raise awareness, improve skincare practices, improve documentation and communication. Implementation of a neonatal skin risk assessment tool in Irish NICUs, together with a national strategy for skin injury prevention, is essential. The development of national standards and evidence-based skincare guidelines from which practice can be benchmarked would assist in standardising neonatal skincare practices in Ireland and improve patient care. Going forward, the ‘2nd Action Research Cycle’ is now in progress in the unit where this study was

undertaken (Figure 3). It is hoped that findings of this second phase will be reported by June 2016.

Conflict of interest

None declared.

REFERENCES

An Bord Altranais (2002) *Recording Clinical Practice, Guidance to Nurses and Midwives*. ABA: Dublin.

An Bord Altranais (2007) *Guidance to nurses and midwives regarding ethical conduct of nursing and midwifery research*. ABA: Dublin.

Ashworth, C. & Briggs, L. (2011) Design and implementation of a neonatal tissue viability assessment tool on the newborn intensive care unit. *Infant* **7**(6), 191-94.

August, D.L., Edmonds, L., Brown, D.K. & Murphy, Y.K. (2014) Pressure injuries to the skin in a neonatal unit: fact or fiction. *Journal of Neonatal Nursing* **20**, 129-137.

Baharestani, M.M. & Ratliff, C.R. (2007) Pressure Ulcers in neonates and children: An NPUAP White paper. *Advances in Skin and Wound Care* **20**(4), 208-220.

Baranoski, S. & Ayello, E.A. (2012) *Wound Care Essentials*. Lippincott Williams & Wilkins: Philadelphia.

Beach, J. & Oates, J. (2014) Maintaining best practice in record-keeping and documentation. *Nursing Standard* **28**(36), 45-50.

Benner, P. (1984) *From novice to expert: excellence and power in clinical nursing practice*. Addison Wesley: CA

Braun, V. & Clarke, V. (2006) Using thematic analysis in psychology, *Qualitative Research in Psychology* **3**(2), 77-101.

Cook, L. (2011) Wound assessment: exploring competency and current practice, *British Journal of Community Nursing* S34-40.

Coghlan, D. & Casey, M. (2001) Action research from the inside: Issues and challenges in doing Action Research in your own hospital. *Journal of Advanced Nursing* **35**(5), 674-682.

Coghlan, D. & Brannick, T. (2005) *Doing Action Research in your own Organisation*. 2nd edition. Sage publications: London.

Dolack, M., Huffines, B., Stikes, R., Hayes, P. & Logsdon, C. (2013) Updated Neonatal Risk Assessment Scale, *Kentucky Nurse* **61**(4), 6.

Fletcher, J. (2007) Wound assessment and the TIME framework. *British Journal of Nursing* **16**(8), 462-466.

Franck, L.S. (2005) Research with Newborn Participants, doing the right research and doing it right. *Journal of Perinatal & Neonatal Nursing* **19**(2), 177-186.

Fujii, K., Sugama, J., Okuwa, M., Sanada, H. & Mizokami, Y. (2010) Incidence and risk factors of pressure ulcers in seven neonatal intensive care units in Japan: a multisite prospective cohort study. *International Wound Journal* **7**, 323-328.

Gartlan, J., Smith, A., Clennett, S., Walshe, D., Tomlinson-Smith, A., Boas, L. & Robinson, A. (2010) An audit of the adequacy of acute wound documentation of surgical inpatients. *Journal of Clinical Nursing* **19**, 2207-2214.

Gethin, G. (2006) The importance of continuous wound measuring. *Wounds UK* **2**(2), 60-68.

Hardicre, J. (2014) Valid informed consent in research: an introduction. *British Journal of Nursing* **23**(11), 564-567.

Huffines, B. & Logsdon, M.C. (1997) The Neonatal Skin Risk Assessment Scale for Predicting Skin Breakdown in Neonates. *Issues in Comprehensive Pediatric Nursing* **20**, 103-114.

Jackson, A. (2008) Time to review newborn skincare. *Infant* **4**(5), 168-171.

Johnson, F.E. & Maikler, V.E. (2001) Nurses' Adoption of the AWHONN/NANN Neonatal Skin Care Project. *Newborn and Infant Nursing Reviews* **1**(1), 59-67.

Kelly, D. & Simpson, S. (2001) Action Research in Action: Reflections on a project to introduce Clinical practice Facilitators to an acute hospital setting. *Journal of Advanced Nursing* **33**(5), 652-659.

Kelly, J. (2005) Interrater reliability and Waterlow's pressure ulcer risk assessment tool. *Nursing Standard* **19**(32), 86-92.

Kemmis, K., & McTaggart, R. (2008) Participatory Action Research, communicative action and the public sphere. In *Qualitative Strategies of Inquiry*. (Denzin, N.K. & Lincoln, Y.S.), 3rd Edition, Sage publications: California. pp 271-331.

Kennedy, M. (2005) Improving pressure ulcer prevention in a nursing home: action research. *Wound Care* s6-s16.

Knoos, M. & Ostman, M. (2010) Oral Assessment Guide: Test of reliability and validity for patients receiving radiotherapy to the head and neck region. *European Journal of Cancer Care* **19**, 53-60.

Koshy, E., Koshy, V. & Waterman, H. (2011) *Action Research in Healthcare*. Sage publications: London.

Kottner, J., Hauss, A., Schluer, A.B. & Dassen, T. (2013) Validation and clinical impact of paediatric pressure ulcer risk assessment scales: a systematic review. *International Journal of Nursing Studies* **50**(6), 803-813.

Kuller, J. (2001) Skin breakdown: risk factors, prevention and treatment. *Newborn Infant Nursing Reviews* **1**, 35-42.

Lamburne, S. (2015) An assessment tool for babies requiring nasal CPAP and high flow. *Journal of Neonatal Nursing* **21**, 2-4.

Law, L., Akroyd, K. & Burke, L. (2010) Improving nurse documentation and record keeping in stoma care. *British Journal of Nursing* **19**(21), 1328-1332.

Lund C.H., Osborne, J., Kuller, J., Lane, A., Wright, J. & Raines, D.A. (2001a) Neonatal Skin care: Clinical outcomes of the AWHONN/NANN evidence based clinical practice guideline. *Journal of Obstetric, Gynaecologic and Neonatal Nursing* **30**(1), 41-51.

Lund, C.H., Kuller, J., Lane, A.T., Raines, D.A. & Thomas, K. (2001b) Neonatal skin care: Evaluation of the AWOHOON/NANN research based practice project on knowledge and skincare practices. *Journal of Obstetric, Gynaecologic, and Neonatal Nursing* **30**(1), 30-40.

Lund, C. (2014) Medical Adhesives in the NICU. *Newborn & Infant Nursing Reviews* **14**, 160-165.

McGurk, V., Holloway, B., Crutchley, A. & Izzard, H. (2004) Skin Integrity assessment in neonates and children. *Paediatric Nursing* **16**(3), 15-18.

Moore, Z. & Cowman, S. (2010) Risk Assessment Tools for the Prevention of Pressure ulcers. *Cochrane Database of Systematic Reviews*. Issue 3, Art. No.: CD006471. DOI: 10.1002/14651858.CD006471.pub2.

Noonan, C., Quigley, S. & Curley, M.A.Q. (2011) Using the Braden Q scale to predict pressure ulcer risk in pediatric patients. *Journal of Paediatric Nursing* **26**(6), 566-575.

Nursing and Midwifery Board of Ireland (2014) *Code of professional conduct and ethics for registered nurses and midwives*. NMBI: Dublin.

O'Brien, J.A.J. & Cowman, S. (2011) An Exploration of nursing documentation of pressure ulcer care in an acute setting in Ireland. *Journal of Wound Care* **20**(5), 197-205.

Ousey, K. & Cook, L. (2011) Understanding the importance of holistic wound assessment. *Practice Nursing* **22**(6), 308-314.

Owen, K. (2005) Documentation in nursing practice. *Nursing Standard* **19**, 48.

Pancorbo-Hidalgo, P.L., Garcia-Fernandez, F.P., Lopez-Medina IM. & Alvarez-Nieto, C. (2006) Risk assessment scales for pressure ulcer prevention: a systematic review. *Journal of Advanced Nursing* **54**(1), 94-110.

Parnham, A. (2011) Innovations in tissue viability documentation for acute services. *Journal of Wound Care* **20**(9), 445-448.

Plummer- D'Amato, P. (2008) Focus group methodology Part 2: considerations for analysis. *International Journal of Therapy and Rehabilitation* **15**(3), 123-129.

Prideaux, A. (2011) Issues in nursing documentation and record keeping practice. *British Journal of Nursing* **20**(22), 1450-1454.

Saigal, S. & Doyle, L.W. (2008) An overview of mortality and sequelae of preterm birth from infancy to adulthood. *The Lancet* **371**, 261-269.

Scheans, P. (2015) Neonatal Pressure Ulcer Prevention. *Neonatal Network* **35**(2), 126-132.

Schumacher, B., Askew, M. & Otten, K. (2013) Development of a pressure ulcer trigger tool for the neonatal population, *Journal of Wound Ostomy Continence Nursing* **40**(1), 46-50.

Shepard, J. & Nixon, M. (2013) Standardising wound care documentation in clinical practice: The wound healing assessment and monitoring (WHAMM) tool. *Wounds UK* **9**(1), 62-66.

Smith, J.R. & Donze, A. (2009) Clinical Practice Guidelines: What are they? Where are they? How good are they? *Neonatal Network* **28**(5), 343-350.

Teasdale, D.T., Brady-Murphy, N. & McSorley, L. (2009) Neonatal guidelines- A positive force or an instant turnoff? *Journal of Neonatal Nursing* **15**, 100-106.

Vance, D.A., Demel, S., Kirskey, K., Moynihan, M. & Hollis, K. (2015) A Delphi Study for the Development of an Infant Skin Breakdown Risk Assessment Tool. *Advances in Neonatal Care* **15**(2), 150-157.

Visscher, M. (2014) A Practical Method for rapid measurement of Skin Condition. *Newborn & Infant Nursing Reviews* **14**, 147-152.