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Original Article

# Survey of neonatal nurses' practices and beliefs in relation to skin health

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ABSTRACT

Despite the reported high prevalence of skin damage in neonatal units, little is known regarding assessment and management of neonatal skin.

A questionnaire was designed addressing beliefs and practices of participants. This was distributed to neonatal nurses across southern England.

In total 56 responses were returned (7% response rate). Incidence of damage was perceived to be high, with 26% of participants reporting that this occurred daily. Skin damage was frequently associated with medical devices, including nasal continuous positive airway pressure, medical tape, and peripheral cannulas. Staff education emerged as a key theme in promoting skin health. However, only 10% of participants had received skin care training. Participants highlighted concerns about the lack of previous research in this area.

The results confirm the vulnerability of neonatal skin to medical devices, with participants citing these as the primary cause of damage. Additionally, skin care is constrained by lack of training and resources.


## Introduction

Hospitalised neonates, especially those who are premature, are at risk of skin breakdown, with reported pressure ulcer (PU) prevalence of 23–31.2% in neonatal intensive care (Baharestani and Ratliff, 2007; Fujii et al., 2010; August et al., 2014). Neonatal care has led to extremely preterm neonates living into childhood in greater numbers, thus injuries associated with this kind of intensive treatment are becoming more apparent (Fox and Rutter, 1998; Smith and Roy, 2006; Hogeling et al., 2012). The structural integrity of the skin has not been fully established in extremely preterm or very preterm neonates (Hammarlund and Sedin, 1979; Harpin and Rutter, 1983; Okah et al., 1995; Kalia et al., 1998). Indeed, in neonates born at 24 weeks' gestation, the stratum corneum is only one or two cell layers thick, dermal elastic fibres are sparse in distribution (Visscher and Narendran, 2014), and the characteristic features of the dermal–epidermal junction are poorly developed (Tortora and Derrickson, 2014). In addition, neonates, including those born at term, have a neutral skin pH, in contrast to the “acid mantle” of older children and adults (Ali and Yosipovitch, 2013; Visscher and Narendran, 2014). Each of these factors contribute to abnormal skin physiology in the neonate, including increased transepidermal water loss (TEWL), invasion of micro-organisms, and absorption of potential toxins from topical products (Rutter, 2003). Although the development of skin following premature birth has not yet been fully elucidated, there is some indication that it may take up to nine weeks for extremely premature neonates to develop a functional barrier maturity (Kalia et al., 1998). The extent to which this affects the risk of breakdown is still to be clarified.

In premature neonates, over 90% of PUs are associated with interventional medical devices (Visscher and Taylor, 2014). Other forms of iatrogenic skin damage have also been reported in this population, including diaper dermatitis, skin tears, and burns (Visscher et al., 2009; Sardesai et al., 2011). Although skin care has been recognised as a key aspect of neonatal nursing (Furdon, 2003), there is a paucity of evidence with which to inform practice, and skin care is primarily based on clinical expertise. Indeed national and international guidelines on the prevention and treatment of PUs do not provide much information related to this specialist

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group (Health and Social Care Information Centre, no date; NHS Institute for Innovation and Improvement, 2011; NPUAP, EPUAP and Pan Pacific Pressure Injury Alliance, 2014) Accordingly, it is essential to explore nurses' perceptions of these issues in order to understand current practice. Although studies exploring adult nurses' perceptions of pressure ulcer prevention have been performed in association with general and critical care settings (Strand and Lindgren, 2010; Gunningberg et al., 2013), very few studies have involved the highly specialised neonatal care environment. One exception to this involving a questionnaire of neonatal nurses in Malaysia reported gaps in participants' theoretical and practical knowledge of preterm neonates' skin (Mohamed et al., 2014). However, this questionnaire did not focus on nurses' perceptions of incidence and risk, and specific prevention practices were not reported.

Although validated tools exist to assess nurses' knowledge and skills in the area of PU prevention (Beeckman et al., 20110b, 2010a), these are focused on general nurses caring for adults. Thus these tools are not suitable for direct translation to the present study for several reasons:

i) the neonatal nursing workforce is made up of staff from a variety of clinical backgrounds (midwives, paediatric nurses, and general nurses)
ii) skin damage in neonates often appears to be related to medical device use, which is not addressed by existing tools
iii) prevention of PUs in neonates is fundamentally different in neonates than in adults due to the immaturity of the skin (Visscher and Narendran, 2014)
iv) current evidence on skin care in neonates is limited (Lund et al., 2001).

This provides the motivation for the present study which has been designed to explore issues related to skin health with neonatal nurses, in order to determine the current state of skin care practice and define the factors that are perceived to increase risk of skin breakdown in this vulnerable patient group.

## Methods

Survey methodology was used in the form of a 19-part questionnaire tool.

### *Development of tool*

Items for the new questionnaire were developed following a combination of processes to ensure face validity (Rattray and Jones, 2007). Draft items were generated from a literature review, the researcher's own experience as a paediatric nurse, and discussion with the lead nurses from a regional neonatal network in the south of England. This draft tool then underwent a process of review by registered nurses (RNs) and nursing assistants from neonatal intensive care units within the network (Fig. 1). During this process, changes in wording were adopted in order to ensure that the questions measured the topics we intended to measure (de Leeuw et al., 2008). The questionnaire was pilot tested with 6 RNs with either adult or paediatric qualifications, which is reflective of the neonatal nursing workforce in the UK. During this process they were asked to comment on the functionality, formatting, and ease of use of the online tool. Following their feedback, the font size was increased, but no other changes were made. It took the RNs on average 15 min to complete the questionnaire.

The questionnaire utilises both open and closed questions. The majority of questions are multiple-choice in nature, with between two and eleven possible responses depending on the question. Ranking and free-text questions are also used. Initial questions concern general demographic information, with more specific questions gradually introduced throughout the questionnaire (Table 1).

### *Sample*

#### *Recruitment*

The study recruited RNs and nursing assistants from the South of England working in three levels of neonatal unit:

1. Special Care Baby Unit (SCBU): for babies who need monitoring of vital signs, supplemental oxygen, tube feeding, phototherapy or convalescence from other care.
2. Local Neonatal Unit (LNU): for babies needing short-term intensive care with respiratory support, including continuous positive airway pressure (CPAP)
3. Neonatal Intensive Care Unit (NICU): for babies who are born at <28 weeks, need respiratory support including ventilation, who weigh <1000 g, and/or need significant CPAP support. These babies may also require surgery or other intensive treatment.

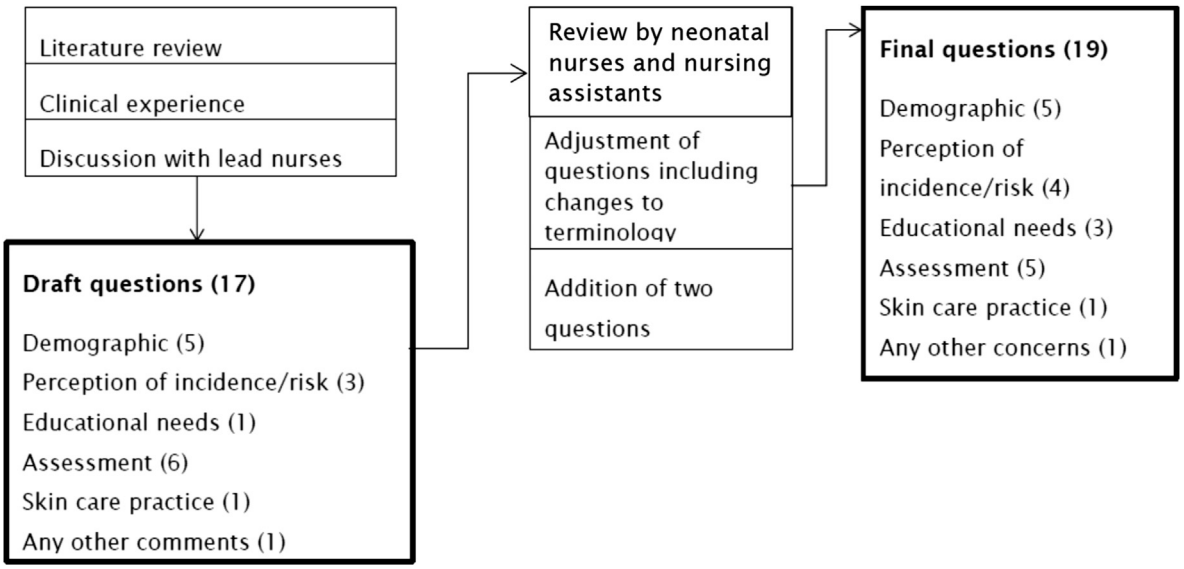


**Fig. 1.** Development process of questionnaire.

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