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Research

Nurse's perceptions on infection prevention and control in atopic dermatitis in children

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Abstract *Background:* Nurses should be conscious of healthcare associated infections, and the standard precautions required to reduce the risk of patients becoming infected. Patients with atopic dermatitis are often predisposed to a higher incidence of bacterial and viral infections. This study aims to explore and describe nurses' understanding and knowledge of their role in infection control and prevention precautions when caring for children with atopic dermatitis.
Methods: Sixteen nurses were recruited from the dermatology clinic, medical wards and emergency department of a metropolitan tertiary referral children hospital for a qualitative exploratory descriptive study.
Results: Thematic and content analysis derived three themes from the data: "the importance of infection prevention and control when managing children with atopic dermatitis", "nurses focus on self-protection", and "educating families on infection prevention and control".
Conclusion: Nurses' perceptions of their role emphasised the need to limit cross-infection between patients when children were admitted with exacerbations of atopic dermatitis. Participants articulated that in their own practice personal protective equipment (PPE) was often used for self-protection and to protect their uniform rather than to protect the child from cross-infection. The importance of providing family members with sufficient education to assist them in managing the child at home was also particularly salient. The importance nurses placed on educating patients and family members about home-management, preventing cross-infection and minimising the occurrence of future exacerbations of atopic dermatitis, highlights the potential to develop interventions to support greater consumer participation in infection prevention for children with chronic relapsing conditions such as atopic dermatitis.

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Highlights

- Educating consumers about infection prevention was a key focus in nursing care.
- Nurses were aware of multiple infection prevention and control guidelines.
- Glove use was not favoured by nurses unless applying creams.
- Self protection rather than minimising infection risk was considered among nurses.

Introduction

Atopic dermatitis (AD) is a chronic inflammatory skin disease that can cause significant morbidity, including skin infection [1]. Children with AD can have an increased number of presentations to health care facilities [2]. To minimise the risk for patients and staff of acquiring such infections it is important that effective prevention and control precautions are implemented.

Patients with atopic dermatitis (AD) are often predisposed to a higher incidence of bacterial and viral infections due to the combination of genetic predispositions for skin barrier dysfunction, and dysfunctional innate and adaptive immune responses [3]. Colonisation of AD lesions with pathogenic bacteria is common. Tang, Wang [4] showed that *Staphylococcus aureus* colonisation ranges between 46% and 80% in patients with AD. Additionally, Suh, Coffin [5] and Spergel [6] indicated that 16%—31% of patients with AD have colonisation by methicillin-resistant *S. aureus* (MRSA) respectively. *S. aureus* infection is a persistent complication of AD and can result in further worsening of the disease [7]. Colonisation with *S. aureus* has been associated with a higher severity and more frequent exacerbations of AD. Bunikowski, Mielke [8] suggested that this is a result of *S. aureus* strains secreting exotoxins with superantigenic properties, instigating a clear activation of T-cells and promoting inflammatory activity. This in turn increases pruritus and prolongs the duration of skin inflammation. The acquisition of MRSA can result in severe skin infections, pneumonia and even lead to septicaemia [9].

According to the National Health and Medical Research Council [10], health practitioners should be conscious of healthcare associated infections, including the different modes of transmission of infection, and the chain of infection. They should also be fully aware of their role in the prevention of transmission of infection, standard and transmission based precautions, and should have knowledge and a basic understanding of a risk management approach to infection prevention and control. Additionally, they should be able to recognise the potential risk for transmission of infection in the delivery of healthcare and decide what measures they should implement. Jackson, Lowton [11] identified the behaviours which nurses' exhibit in relation to infection prevention. These behaviours were found to, sometimes, be inappropriate or harmful. They found that nurses wanted to perceive themselves as knowledgeable practitioners, but they did not always follow policies and procedures.

Although the principles of good infection prevention and control are well known there is limited research exploring how clinical nurses apply these principles when providing care and education for children with AD. This study explores and describes nurses' understanding and knowledge of their role in infection prevention and control and the use of SP when caring for children with AD.

Methods

Design

A qualitative descriptive method was used to obtain semi-structured data from registered nurses on their attitudes and knowledge of infection prevention and control (IPC) and SP in relation to AD management.

Participants

A non-probability voluntary sample of 16 adults was recruited from the workforce of a tertiary metropolitan children's hospital. All participants included in the study were registered nurses. Out of the 16 participants 15 were female, one participant declined to provide their age with the mean age being 31 (SD = 7.9). Academic qualifications of the participants ranged from Graduate Certificate to Nurse Practitioner degree, with almost half of the sample (43%) holding a Post Graduate Diploma. The majority of the participants had been qualified between 1 and 7 years (M = 9.2). Participant recruitment was stopped once theoretical saturation of the data was achieved.

Procedure

Potential participants were invited to attend an open information session at the facility. The details of the project were provided, together with an invitation to participate. In addition, an information flyer was placed on staff notice boards inviting staff to participate. Interested parties were invited to attend one of several scheduled focus groups or to contact the researchers to make a one-on-one appointment. Network and snowball sampling were also utilised. Interviews and focus group were audio-recorded with the permission of participants and subsequently transcribed.

Notes were also taken during the interviews and focus groups and these notes were used to present a summary of the discussions to participants towards the end of the session, in order to confirm the veracity.

All participants were required to provide demographics data on their gender, age, qualifications, and continuous years of practice since graduation. Twelve participants volunteered to participate in a focus group and four in one-on-one interviews. Semi-structured interviews and focus groups lasted between 20 and 40 min. Participants were asked "What infection prevention and control measures do you utilise when caring for children with AD?". All members of the research team were involved in the data collection process that was undertaken, in keeping with the study's exploratory descriptive focus.

Ethical considerations

This study was approved by the appropriate university and healthcare facility ethics committees. The data were confidential but not anonymous as participants were seen by the interviewer. No names, however, were collected and all participants were requested to avoid using people's names during group discussions or when conversing amongst themselves. Any names inadvertently used by participants were not transcribed.

Data analysis

The interviews and focus groups were transcribed verbatim into a Word document. Thematic and content analysis were used to identify themes and patterns within the data, commonly used in naturalistic inquiry [12]. Interviews transcripts were examined line by line, and the data sorted and segmented into common themes, patterns and categories. Categories were created, where key themes, words, phrases or events were grouped. The second stage of data analysis included re-examining the pre-grouped categories to identify emerging themes. Data were coded, categorised and key themes identified by two researchers, with a third one independently checking the accuracy of the coding and theme identification.

Results

All of the participants in the study discussed different infection prevention and control methods they used when caring for children with AD. The themes derived from the participants' answers were: "the importance of infection prevention and control when managing children with atopic dermatitis", "nurses focus on self-protection", and "educating families on infection prevention and control".

Importance of infection prevention and control when managing children with atopic dermatitis

Participants discussed the importance of infection prevention and control management in the context of managing children with AD and preventing cross infection between patients. Most participants incorporated the concept of infection prevention and control into their everyday practice. All of the participants in the study discussed different IPC methods they used when caring for children with AD. The common methods that were mentioned included, not double dipping when applying creams, hand washing, and using Personal Protective Equipment (PPE) (Table 1).

Table 1 Importance of infection prevention and control when managing children with atopic dermatitis.

Nurse 4	"So, we don't recommend double dipping into tubed creams, so you know we have measures where they can use a spoon or a spatula or something, so they can decant the creams. Similarly, with the tubes we try not to encourage them to rub their finger across the top of the tube because they've got bacteria on their fingertips or skin it can it can transmit to the tube. So, they are the basic [IPC] measures its more just in their applications of the treatments"
Nurse 15	"The old not double dipping"
Nurse 1	"Hand washing, don't double dip in creams, only use dressings once"

Focus on self-protection

One key theme that was derived from the interviews in all environments was the use of PPE for self-protection. Some participants described their use of PPE as self-protection, more specifically their clothes, rather than for the protection of patients. Participants that stated they used gowns and gloves together were using them when performing tasks that could result in them getting wet or having creams on their uniforms (Table 2). Some nurses however did state that they used PPE as a method of protection when touching patients directly and providing care, which follows standard precautions. A different perspective emerged from the dermatology nurses, they discussed the use of PPE and while they were using them appropriately, they did not describe the same focus on self-protection. Use of proper hand washing practices were mentioned more by the dermatology nurses, than the ward nurses.

Educating families on infection prevention and control

Education is a major role in nursing, as paediatric nurses are frequent collaborators in care with family members. This collaboration allows nurses to recognise the family's level of understanding about caring for children with AD and the areas in which education should be focused so that the child is managed effectively at home. When participants discussed the education of family members about AD, the importance of infection prevention and control strategies also emerged as an important component (Table 3). This included the use of bleach baths for *S. aureus* reduction, not reusing dressings, and not double dipping when applying topical medications.

Table 2 Focus on self-protection.

Nurse 6	"I think it's mainly because my clothes get wet and dirty, as oppose to infection prevention"
	"If I'm just doing small interventions like if I'm just going in the room to see them, I don't necessarily gown and glove but if I'm doing something to do with their eczema care. In terms of dressing or popping them in the bath then I gown and then glove."
	"I gown and glove when I'm touching them"
Nurse 14	"Gloves and gowning usually, mainly just because you don't want to get creams and stuff on your scrubs."
Nurse 11	"I would do contact [precautions], and also because I don't want to get covered in cream"
	"I tend to do, if it's infective, I do contact precautions. If it's not infective I would still wear gloves when I'm putting on steroid cream for them, to protect myself, and I also don't feel comfortable putting my hands on manky skin"
	"I guess in a sense they have got broken skin so they are also at risk of picking up an infection from us, but it's just your contact precautions for them and for us"
Nurse 5	"I think that people use a gown regardless because you're going to get wet usually when you're doing the wet dressings"
	"Other than washing our hands and … making sure that we are not covered in eczema skin when we go to care for the next patient."
Nurse 2	"If I was in an outpatient, I … probably wouldn't have the gowns, but I would probably use, … I'd use gloves, and I love the hand gel, so I use heaps of the hand gel. Obviously, I do that beforehand."
Nurse 1	"I don't wear gloves; a lot of the nurses do, but I don't like. I like to feel the skin so I am a hand washer. I'm not a big, (although I do, do all my hand washing things), I'm not a big … alcohol [gel] user."

Table 3 Educating families on infection prevention and control.

Nurse 1	"I would recommend bleach baths, and go through with parent's staph reduction, so not sharing towels, washing hands before touching the skin, not double dipping creams"
Nurse 12	"I tell the parents to put gloves on too"
Nurse 6	"I think education for families as well, I think that's a big part of management because they often their have no idea or they often have an idea but haven't been able to do it at home"

Discussion

The aim in this study was to explore and describe nurses' understanding and knowledge of their role in implementing effective infection control and prevention precautions when caring for children with AD. Three themes were drawn from the data: the importance of infection prevention and control when managing children with atopic dermatitis, focus on self-protection and educating families on IPC.

IPC is a major component of care and thorough implementation of IPC principles may reduce the need for antibiotics when AD flares up. There are elements a nurse should take into consideration in addition to the IPC precautions, when caring for patients with AD. Coyne, Timmins [13] suggested that the nurse should not wear gloves when examining the skin, unless there is a suspicion of an infection, as wearing gloves can make the patient feel stigmatised and unapproachable. Additionally, ensuring that nurses do not "double dip" when moisturising patients, as Sidbury and Poorsattar [14] found that recurrent infection can result from "double dipping" into an emollient from a contaminated container, when moisturising.

In this study, it emerged that IPC measures were used by some nurses for self-protection rather than to prevent the cross-transmission of pathogens and prevent children's AD from becoming infected. One nurse specifically stated that: "I think it's mainly because my clothes get wet and dirty, as oppose to infection prevention". This statement is of concern, as a lack of correct IPC practices and education can result in an increase in infections, thereby increasing the need for antibiotics. Bouchoucha and Moore [15] showed that despite the use of standard precautions being mandated, staff would often deviate from them based on their own assessment of the situation or the patient, with self-protection also being a consideration when judgements about the applicability of guidelines to a specific practice context were made. A recent study performed by Thom, Escobar [16] discussed health care workers' scrubs becoming contaminated with bacteria during patient care. They concluded that there was frequent bacterial contamination of health care workers' scrubs. Specifically, pathogenic bacterial contamination was found when providing care for patients with wounds or giving a bath. However, there were lower contamination rates on scrubs of healthcare workers who were assigned patients with contact precautions.

While some of the nurse's judgements on a situation reflected that of self-protection, disgust was also a theme that arose when discussing IPC precautions and PPE. Not only did their practices reflect not wanting to get their work clothes dirty as opposed to infection prevention, but rather that they did not want to touch "manky skin" or "get covered in eczema skin". The notion of disgust amongst nurses has also been referred to in multiple studies. For

example, Jackson, Lowton [11] found that standard precaution guidelines, although originally intended for IPC practices, were used by nurses as a form of self-protection when nurses considered patients as "dirty". These findings show that elements of disgust can occur in the paediatric population, despite Bouchoucha and Moore [15] finding that children were considered cleaner than adults. The current study does not support this finding, as the participants' responses indicated that some nurses experienced a level of disgust when caring for children with AD.

This study showed that the nurses' education role expanded over all departments; for new diagnosis patients attending 'eczema workshops' educating families and patients on AD management and treatments, to the ward and the ED which followed up this education, or provided it for the first time if families had not yet been seen at the dermatology clinics. For patients with chronic relapsing conditions, nurses should supply patients with explanations to better comprehend their condition and management strategies, to provide successful treatment and improve patients' quality of life. The importance of educating patients and their families was viewed as fundamental to successful long-term management of AD by the ward nurses who identified that repeat presentations to the hospital's Emergency Department, were often as a result of parents lacking an understanding of the disease process and its treatment. This finding is supported by Krakowski [17] who showed that thorough education can reduce the clinical manifestations of AD and the frequency of AD exacerbations. A report from the New Zealand Ministry of Health explained that parents and caregivers should receive regular and accessible guidance in order to develop skills and knowledge to prevent and manage skin infections [18].

Nurses and other health care professionals are encouraged by Say and Thomson [19] to involve patients in decisions regarding their treatment, and to recognise that patients are experts with preferences for treatments. Lawton, Roberts [20] emphasised this when they stated that the nurse's role is about more than just giving parents information about their child's condition, it is about acknowledging their role in managing their child's care and empowering them and their family to handle their child's condition. A Cochrane review also showed that there is a link between the use of different educational intervention delivery models, such as "eczema workshops" or nurse-led clinics, and improvements in the severity of AD and the patient's quality of life [21]. The study findings underscore the importance nurses placed on IPC by providing education to families on good hand hygiene practices. These findings demonstrate that nurses recognise the role patients and families play in infection prevention as they identified providing family education as a core strategy in targeting IPC [22].

Strengths and limitations

A strength of this study is the design, which allowed us to gather data on IPC practices from three different areas of the hospital. However, the small sample size could be perceived as a limitation to the study. The small sample size is justified as valuing the richness and depth of the participant experience rather than using survey methods to capture relatively superficial responses from a larger number of participants [23]. Another potential limitation is the fact that some participants might have been afraid to voice their opinions in focus groups or interviews. Such reluctance could have given rise to a social desirability bias. Regardless of these limitations, the data obtained and the analysis provide rich data enabling a deeper understanding of nurses' perceptions of how IPC and SP should be implemented in the context of AD.

Conclusion

Nurses' perceptions of their role emphasised the need to limit cross-infection between patients when children were admitted with exacerbations of AD. The importance of providing family members with sufficient education to assist them in managing the child at home was particularly salient. Participants articulated that in their own practice PPE was often used for self-protection and to protect their uniform rather than to protect the child from cross-infection. The importance nurses placed on educating patients and family members about home-management, preventing cross-infection and minimising the occurrence of future exacerbations of AD, highlights the potential to develop interventions to support greater consumer participation in infection prevention for children with chronic relapsing conditions such as AD.

Ethics

Ethics approval was granted by Deakin University Human Research Ethics Committee (2017-031). This project was also approved by The Royal Children's Hospital Melbourne Human Research Ethics Committee (36284A). Informed written consent to participate was obtained from all participants.

Authorship statement

MK, AH, and SB all contributed to the study design and the concept of this paper. MK conducted the study and analysed the data with contributions from AH and SB. All authors provided significant intellectual contribution to the paper. All authors contributed to the revision of the manuscript, and approved the final manuscript.

Conflict of interest

None to declare.

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Provenance and peer review

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