Management of skin infections in Pacific children prior to hospitalisation

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ABSTRACT

INTRODUCTION: Hospital admissions for childhood skin infections in New Zealand (NZ) are on the increase. Pacific children make up a high number of those who are admitted. This study describes the parents of Pacific children's understanding and management of skin sores in the home prior to the sores becoming infected and requiring hospital admission.

METHODS: A descriptive qualitative approach combined with the Pacific research frameworks of *Fa'afaletui* and the *Metaphor of Kakala* were used to elicit parents' understanding and management of children's skin sores in the home. The semi-structured interviews were conducted in English or Samoan, and all transcribed into English.

FINDINGS: Mothers of 11 Pacific children admitted with skin infections between 2006 and 2008 were interviewed. The children's infections started with insect bites in some cases. Parents actively sought treatment to ensure children's optimal health was maintained. Initial management included a 'watch and see' approach for some, until deterioration was noted.

CONCLUSION: This is the first known study in New Zealand that has captured children's experiences when sustaining a skin infection/s and the activities that took place while seeking treatment in the community. Although most of the children received medical attention in primary health care (PHC), this did not prevent the need for hospital admission. The acuteness and seriousness of children's health on admission shows that preventive efforts need to increase and the early management of infections in PHC settings needs to be better understood.

KEYWORDS: Children; Pacific health, primary health care; skin infections

Introduction

Skin sores are often viewed as a benign skin problem that require basic hygiene care or heal naturally without medical interventions. This general assumption may be true in many cases. However, statistics on New Zealand (NZ) children reveal skin infections are a serious health problem.[1] Children spend days in hospitals for secondary interventions, including extensive surgery.[2–4]

Skin infection is a broad term given to various infections of the skin caused by the presence and colonisation of microorganisms. *Staphylococcus aureus* and *Streptococcus pyogenes* are the predominant causative organisms.[5–6] Cellulitis, impetigo, furuncles and carbuncles (simply known as abscesses or boils) are the most common infections that result in children's hospitalisation.[6] It is a worldwide problem; however, NZ children are significantly affected compared to other developed countries, such as Australia and the United States of America.[1–2] Over a decade ago, cellulitis was ranked the third commonest reason for children's hospitalisation in the Auckland region.[7] The review of skin infections for Wellington shows the admission rate for children aged 0–14 years increased significantly between the years 2002/03–2008/09, with Pacific and

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Maori children making up a high proportion of those admitted.[1,8]

Despite the lack of published literature, the available information has consistently reported the disproportionate representation of Pacific children with serious skin infections.[1,2,7,8] They were the leading cause of acute hospital admissions in children for the years 2002–2006.[9] Statistics on skin health contributes to the recognised poor health status of Pacific children.[10–12] Pacific children were more likely than other children to acquire staphylococcal bacteraemia.[4,13] Four children, of whom three were Pacific were reported to have died of this cause in the NZ study reported by Hill and colleagues.[4] Deaths have also been reported in a further study, but ethnicities were not specified.[13]

While the high number of hospital admissions with skin infections in children is a concern, the information available on why this is so is scattered and not well understood. Preventative measures primarily focus on hygiene and household crowding as the key factors known to play a major role in the spread of infectious diseases.[14–15] Parents' roles in managing the children's sores at home are also crucial, but are poorly understood and have not been researched.

This research was designed to explore the knowledge and understanding of parents of Pacific children in relation to managing skin sores in their child in the home prior to the wound becoming infected and requiring hospital admission. Recognition of the early signs and symptoms of infection and access to health care in the community were also explored.

Methods

A descriptive qualitative approach[16–17] combined with the emerging Pacific research frameworks of *Fa'afaletui*[18] and the *Metaphor of Kakala*[19] were used. This study takes into account the importance of the 'three different perspectives' or views used in the Fa'afaletui framework to ensure 'critical knowledge and understanding' of the research topic is obtained by carefully considering the perspectives of three key parties involved. These perspectives are of the participants' (mothers of admitted children) accounts, the researcher's view on how the study is conducted and the supervisor's and mentor's guidance throughout the study.

The Metaphor of Kakala by Konai Helu Thaman[19] was used to inform the research. The three key elements associated in the making of the Kakala are *toli* (gather), *tui* (weave), and *luva* (presenting). In this study, toli refers to the collection of the data through the interviews. Tui refers to the careful selection and analysis of the data into themes; and this article is one aspect of the luva process, that is, presenting and sharing results. Comparative analysis was also incorporated to highlight the basic differences and similarities amongst the participants' accounts in managing the children's skin sores. The criteria used to ensure rigorous findings were the six elements of research 'goodness' recommended by Arminio and Hultgren.[20] A key to this process was using an audit trail and honouring the participants' voices. The study was approved by the Central Region Ethics Committee.

Parents were recruited through the eligibility of their children. Inclusion criteria were: a child of Pacific ethnicity; aged between 1 and 14 years; admitted for either cellulitis, infected boils, or infected sores. Children who were admitted with infected eczema were excluded. Recruitment involved using flyers in children's wards, Aoga Amata (Samoan preschools), and primary health care (PHC) services and paediatric nurses identifying and asking parents if they would be interested in the research. Parents were provided a written information sheet to make an informed choice whether to participate.

The mothers of the 11 children who were admitted and discharged up to 18 months earlier agreed to be interviewed. A face-to-face semi-structured interview, with a mix of closed and open questions, was used to elicit parents' knowledge and experiences. The interview was divided into nine sections. These included the participant's relationship to the hospitalised child; the sequence of events leading to hospital admission; why the child was admitted and the home remedies initially utilised; the family contacts with PHC services about the skin issue prior to admission; the first aid facilities the participants had in their homes;

the participants' understanding of skin injury and infection hygiene practices; family practices regarding hand washing; participants' training in first aid; and demographic information. Ten audiotaped interviews, ranging from 45 to 90 minutes in length, took place in the participants' homes, and one at a workplace. Seven interviews were fully conducted in English, three in Samoan, and one in English with some Tongan. The principal investigator spoke English and Samoan. All interviews were transcribed into English.

Findings

Eleven Pacific children aged between three months and 15 years old who were admitted with skin infections between January 2006 and January 2008 took part in this study through their mothers sharing their experiences. All 11 mothers lived in NZ; six were born and raised in NZ and five were born in the Pacific Islands. Seven spoke English as their first language while four had English as their second language. Three mothers were employed full-time, six worked part-time and two mothers were not in paid employment. Table 1 summarises participants' demographic information. Fathers played active roles in caring for the children's sores despite the absence of their voice in the study.

Overall, parents were not concerned about the general wellbeing of the children before admission. One child had Type 1 diabetes. Six children were reported to have other family members with skin infections. Some relatives lived in the same household, while others lived elsewhere but had regular contact with the children. All children were registered with a general practitioner (GP).

The accounts summarising the pre-hospitalisation events are outlined in Figure 1. Nine children were seen by GPs for skin problems prior to admission. Of these nine, four saw the GP once and five saw the GP two or more times. Three children were referred to the Accident and Emergency (A&E) by the GP and six were referred by the parents as the child's condition deteriorated. The two children who did not visit their GP were admitted when they presented to the A&E department. Home interventions and admitting diagnosis are summarised in Table 2. Mothers' descriptions of the events leading to hospital admission are presented in themes that emerged from the data analysis.

WHAT GAP THIS FILLS

What we already know: New Zealand has a high number of hospital admissions for skin infections in children. Pacific children make up a high number of these admissions.

What this study adds: Parents were committed to ensuring children accessed medical care in primary health services but this did not prevent them from being hospitalised. The acuteness and seriousness of children's health on admission shows preventive efforts need to increase and the early management of infections in primary health care settings needs to be better understood.

Table 1. Demographic information for mothers and children involved in the study.

	Mother			Child	
	Age	Ethnicity	Place of birth	Age group	Sex
1	25	Cook Island/Maori	New Zealand	Infant	Male
2	41	Tongan	Tonga	Teenager	Male
3	30	European	New Zealand	Preschool	Female
4	39	Samoan	Samoa	Teenage	Female
5	29	Tokelauan	New Zealand	Infant	Male
6	34	Samoan	Samoa	Infant	Female
7	28	Samoan	New Zealand	Toddler	Male
8	39	Samoan	Samoa	Toddler	Female
9	31	Cook Island	New Zealand	Toddler	Male
10	31	European	New Zealand	Preschool	Female
11	40	Samoan	Samoa	Infant	Male

Parents in action

Parents took actions in an effort to maintain the wellbeing of their children, despite their uncertainty on how the changes on the child's skin occurred. Parents' actions in managing the sores were guided by their understanding and beliefs on what they thought would work best.

Recognising and monitoring the signs and symptoms

Parents were first alerted to the children's illnesses by the unusual changes or appearances of the skin, which they simply referred to as a rash, red spot or pimple. The phrase 'I thought it was

Figure 1. Events prior to admission for each child.

Child #1—Admitted with orbital cellulitis.
The mother thought it was a 'pimple' until a Kohanga Reo teacher pointed out to the mother her child had chickenpox. The rash started with one 'spot' on his back which later spread to the rest of his body. The spot on the right eye got infected which initiated the admission.

Child #2—Admitted with infected insect bites.
The child sustained the insect bites while on holiday in the islands. The child received treatments while in the islands and was doing well. The child was subsequently admitted three weeks after returning to New Zealand.

Child #3—Admitted with cellulitis of the calf.
The mother thought this had started from an insect bite. The mother thinks her daughter is allergic to insects, as the child had had previous hospital admissions for similar skin problems. Other admissions were from different causes.

Child #4—Admitted with an infected toe.
The wound was healing and responding well to the home remedies until a friend accidently stood on the injured toe, which then became inflamed and infected. The child had recently been diagnosed with Type 1 diabetes—had had previous hospital admissions. During the course of the infected toe, the child's diabetes 'got out of control' which led to an urgent visit to Accident and Emergency (A&E).

Child #5—Admitted with 'small spots or blisters' in the nappy area; Staphylococcus aureus was found to be present.
Grandmother who cares for the baby during the day was concerned about the nappy rash. The mother didn't take much notice until a nappy change in the evening and found that the rash was spreading and turning into 'big blisters'. The child was urgently taken to the A&E and was admitted.

Child #6—Admitted with cellulitis of the periorbital area.
The mother said she first noticed a little pus in the child's eye and did not take much notice until the eye swelled up. Medical help was sought when the mother saw immediate danger to the child's health. The mother could not explain how it got to this stage.

Child #7—Admitted with cellulitis of the lower extremity; Streptococcus pyogenes was present.
The child attended preschool and the mother thought the child got flea bites from playing in the sandpit. The mother sought medical treatment for the skin sores. One bite was noticeably becoming worse overnight which resulted in admission.

Child #8—Admitted with an abscess in the left groin; Staphylococcus aureus was present.
The mother first noticed a red spot in the groin area. The mother applied thumb pressure hoping it would stop the boil from growing but the child ended up in the hospital having minor surgery. The child was seen by a medical doctor and a traditional healer in the community.

Child #9—Admitted with bullous impetigo.
This started with what looked like flea bites. The sores got worse over a couple of days and affected the child's whole body. The child had a history of 'bad reactions' to insect bites in the past. This time it 'got out of control' and led to admission to the hospital.

Child #10—Admitted with a boil in the perineal area.
The child alerted her mother to a 'pimple' in her groin. The mother knew it was a boil and immediately sought help from a friend at a chemist. A dressing was applied to draw out the pus but was unsuccessful. The boil grew bigger overnight and the child ended up in hospital for minor surgery.

Child #11—Admitted with orbital cellulitis.
The child's eye became red and swollen from an unknown cause. The mother applied drops of breast milk but the swelling got worse over the weekend. The child was seen by the GP and was urgently referred to hospital.

just a pimple' was often referred to by the mothers to describe their initial response to the skin changes. As Mother #5 puts it:

> It started with two pimples ... it's like small pimples, so I thought they were just heat rash.

While some mothers were unable to provide precise information on what caused the 'rash' or the 'spot' on the child's skin, four mothers referred to insect bites as the cause.

> [He] came up with what looked like flea bites... in the morning he showed us he'd been bitten all up his left arm and they were quite red, they looked like angry rashes... One in particular at the back of his right leg started to bubble, he [also] had bites on his left foot. (Mother #9)

One mother mentioned the probable link between her child's sores and other family members while the rest did not. The other relatives with the infected sores were not sick enough to be admitted.

> I thought she got it from my dad because my dad got an eye infection just before she did. He was admitted to the hospital because it was getting worse. (Mother #6)

Parents' initial responses to the signs and symptoms

Parents' initial responses to the children's signs and symptoms took a variety of forms, such as cleaning and tidying up bedding, soaking the wound in salty water, or home baths using antiseptic solutions. The three mothers who kept first aid kits in the house did not mention the use of this resource when treating the children. Some sought both conventional and traditional medicine.

> I try to treat it at home... well sometimes I gave her that, kind of Pinetarsol in the bath, I put her in the bath or bathed by my mother-in-law... they give her the Samoan oil and Savlon. (Mother #3)

When one method did not work, others were tried.

> I gave him the leaf called Bora Bora... but then it did not settle. When it did not settle that day we took him to the chemist. (Mother #2)

Mothers' actions were also targeted at preventing other children from becoming infected.

Table 2. Admitting diagnosis and care children received before admission

Child	Admitting diagnosis*	GP visits and hospital referral	Who referred to hospital	Home interventions	First aid kit
1	Cellulitis: orbital (chickenpox)	Referred on 2nd visit	Health centre	Bath with Pinetarsol; calamine lotion applied	No
2	Insects bites	Seen and sent home	Parents	Herbal leaves, sea bath and cream (while in the Islands)	No
3	Cellulitis: calf	Seen and sent home	Parents	Bath with solutions (unsure of name)	No
4	Cellulitis: toe (Diabetes Type 1)	Seen and sent home	Parents	Wound cleaned with salty water (homemade solution) and covered	No
5	Infected nappy region *S. aureus*	No	Parents	Vaseline	No
6	Cellulitis: periorbital	No	Parents	Applied mild pressure with thumb to the affected eye	No
7	Cellulitis:leg *S. pyogenes*	Seen and sent home	Parents	Ointment and bath	No
8	Groin abscess *S. aureus*	Seen and sent home	Parents	Ointment and Pamol; traditional herbs	Yes
9	Bullous impetigo	Referred on 1st visit	Health centre	Bath cleaning; mother attempted to clean and burst blister	Yes
10	Boil: perineal area	Seen and sent home	Parents	Dressing material from chemist	Yes
11	Cellulitis: orbital	Referred on 1st visit	Health Centre	Drop of breast milk; eye cleansed with warm flannel; mild pressure applied on affected eye	No

* Diagnosis for each child was included with the information given to the researcher.

> We stripped the bed, cleaned all his linen, around the bedroom and the clothes that he'd been wearing. We also did the same for his baby brother because... they share the room together. (Mother #9)

The search for healing and cure

The search for healing and cure was sought between medical doctors and traditional healers simultaneously for some children. Help was sought when the changes on some children's skin were first recognised, while others took the 'wait and see' approach and sought help later when the signs and symptoms appeared to be worsening.

NZ-born parents used conventional medicine only, while Pacific Island–born parents utilised both traditional and conventional medicine. Mother #8 (Pacific Island–born) went between the traditional practitioner and the GP, as the medicine prescribed did not work and she feared her child would be operated on if she took her to the hospital.

> The redness was more noticeable on the second day. It [boil] was getting bigger as if it was spreading. I took her to the family doctor but only Pamol and a cream were given to help take the pain away. I have applied them for two days but no change, so I took her to the fofo Samoa... to see if there was something to draw the pus out, in case we take her in [to the hospital] and that will make her very sick, [and doctors] incise the boil and make her very sick... The Samoan fofo [gave her] ... Samoan medicine. It was a leaf of a plant... we just covered the boil overnight with it, that helped draw the pus out, but [child] didn't take herbs orally. (Mother #8)

Children's health deteriorated rapidly

Parents were caught by surprise with the sudden acute changes in the children's conditions. The uncharacteristic behaviour and the worsening changes such as fever, pain, persistent crying and the increasing size of the 'pimple' or the 'spot' alerted and heightened parents' concern that the child was experiencing something more serious than just a pimple or rash.

> Oh he was really [sick], really, he's got a fever. And his body was all red and he [was] really hot, he can't even lie down, he wasn't comfortable so we [had to] rush him to the hospital. (Mother #2)

> It happened very fast. It was a big bubble on his leg, it was all red, he was crying, he had a fever so we took him straight to A&E and they admitted him, they said that oral antibiotics is not going to work so he has to get a drip. He started vomiting as well... we could tell he was dehydrating, [he was] really unwell. (Mother #7)

After home interventions were to no avail, parents decided to seek medical help. However, some parents encountered problems arranging appointments. One family was told there was no appointment available due to a shortage of doctors. The father persisted and took his son to the health centre. The child was urgently referred to the hospital after a quick assessment by the doctor.

Health information for parents

Access to information on skin infections was the least discussed topic of the interviews. When mothers were asked about the topic, 'No' was the direct response. Despite the number of contacts with health professionals in the PHC settings, mothers had very little recollection of health information on skin infection being offered to them. Similarly, most mothers had the same recall of their experiences in the hospital setting. Only two recalled education being provided on hygiene and handwashing. Of these, one mother said she did not understand the information presented to her as English was her second language. Mothers generally spoke of health professionals being more interested in finding out what happened than in providing them with the information they needed at the time.

Besides hygiene care, Mother #4 recalled previous conversations with health professionals who emphasised the importance of seeking medical help early for her daughter with diabetes.

> About two days [after sustaining the injury] when she felt the pain, she said it's better to go to the hospital, because the nurses/doctors [referring to the GP service] told us any problem with the skin, even if it's just a minor scratch, we should bring her to the hospital.

All mothers wanted more information about skin infections. Some of their suggestions were that parents should be given information on what skin infections are, the causes, and how to treat them before they get infected. Mother #4 questioned the effectiveness of giving mothers pamphlets without one-to-one practical directions.

> I don't know anything about skin infections. But I thought about it at the time while I was treating him. I thought, this is how I treated him in [the island] it will make it a bit better but in the future time I'd rather learn more about skin infection. (Mother #4)

Mothers found the ordeal unpleasant and frightening. In retrospect, two shared how they now looked for infections more often and were more conscious of regularly checking their children's skin. One remarkable finding in this study was the absence of preventive information on skin health in the Well Child Tamariki Ora booklet. This absence is an indication of skin health being a low priority compared to other health issues in children.

Discussion

This is the first known study that has captured mothers' accounts of managing children's skin sores in the home. Parents were forthcoming with information that revealed their active participation during the course of the children's illness. Mothers' accounts revealed their commitment and efforts to ensure children's optimal health were maintained. Their willingness and determination to protect their children from harm are notable findings. However, despite their best effort, children ended up in the hospital with systemic infections requiring aggressive medical and surgical interventions.

The active roles displayed by parents in this study are consistent with the findings from previous studies.[21–22] The majority of parents were highly motivated and remained committed by intervening and pursuing treatments once the child's symptoms were recognised. Despite their innocuous initial perceptions and uncertainty about how the skin changes had occurred, parents took actions which they thought were appropriate. Monitoring children's conditions led to urgent visits to the hospital.

Parents' interpretation and understanding of children's symptoms varied. It has previously been acknowledged that symptoms of children's illnesses are often 'context-bound [and] subjective' in nature.[23] The meanings of serious and minor symptoms are open to interpretation and many symptoms are only regarded 'as serious in retrospect either by lay people or professionals'.[23] Some parents took the 'wait and see' approach which is consistent with results from previous studies.[24] However, such actions are considered a 'laid back' approach by some health professionals. Pacific parents' 'relaxed attitude towards things' on the basis that things will improve on their own has been referred to as 'unhealthy optimism'.[25] The majority of parents in this study did not display a 'relaxed attitude'. Help was sought when the symptoms first appeared for some, while others waited and took action when children's situations deteriorated. Even if children saw a GP, most children's symptoms were not considered serious and children were usually initially sent home. A recent examination of GP records indicates that the majority of children with skin infections are successfully managed by PHC.[26]

One remarkable finding in this study was the absence of preventive information on skin health in the Well Child Tamariki Ora booklet. This absence is an indication of skin health being a low priority compared to other health issues in children.

Most of the children were acutely admitted for the purposes of administering intravenous antibiotics and/or performing minor surgery. These are extremely costly ways of dealing with the health issue[2] and can be traumatic for children and families. Access to PHC is an opportunity to prevent unnecessary hospitalisation.[27] The notion that high cellulitis admissions for Pacific children is an indication that access to PHC is particularly poor for this population group[28] was not con-

firmed in this study. All children were registered with a GP and most received medical attention more than once before admission. Children in previous studies had similar experiences.[21–22]

An apparent lack of PHC nursing contact with parents and children is evident in this study. For example, there was no mention of contacts with Plunket nurses for children under five years old, or mention of contacts with public health nurses for school-age children. The absence of nursing contacts with children was not explored in depth; therefore, this finding needs to be treated with caution. However, a question arises from this finding as to whether children's health outcomes would be different and hospitalisation avoided if PHC nurses were to intervene.

A variety of education materials on skin infections is available in the English language. The fact that mothers did not mention these resources raises questions about the accessibility, utilisation and effectiveness of these materials.

A variety of education materials on skin infections is available in the English language. The fact that mothers did not mention these resources raises questions about the accessibility, utilisation and effectiveness of these materials. The need to discuss the information with parents face-to-face in a language they understand was highlighted in an international study[29] and was confirmed in this study. Messages on the spread of infections in the household need to be reinforced whenever any person—adult or child—has an infection, as at least one child in the study had an older relative who had a skin infection. Mothers relied on their cultural and traditional knowledge to guide them through the ordeal. The use of traditional medicine is a practice that is popular with Pacific people and it is likely that they will continue to use them for healing and cure[30] when they consider this necessary. Acknowledging existing knowledge and cultural beliefs is important, as this contributes to the success in the process of educating parents[31] and positive health outcomes for children. Given that skin infection is a growing health problem, we recommend that skin health information is included in the Well Child Tamariki Ora booklet. This resource is of great value to all New Zealand parents and should be in different languages.

Socioeconomic status and hygiene are well-known determining factors for skin health. However, this study draws attention to the need to explore other factors at the PHC level that are likely causes of failure to smooth recovery from a simple skin sore. These include the effectiveness of treatments in the early phase and the appropriateness of health resources and education. An exploration may involve establishing evidence-based guidelines for what are the effective treatments children should receive on their first visits to PHC with skin infections. A protocol for the management of children's skin sores in the community is in progress in Greater Wellington coordinated by Regional Public Health.

PHC nurses should be more vigilant in their assessment and follow-up of children who present with minor sores. A well-coordinated referral system between public health nurses, and PHC nurses, including practice nurses, should be in place to ensure parents and children are provided with the best support they need to ensure a child's uncomplicated recovery. Medication adherence was not discussed in detail with the mothers in this study due to the likely inaccuracy of details regarding this.

The findings raise issues for further research for the prevention and management of skin sores in Pacific children. An expanded, comprehensive study to verify results in this study is recommended. The high use of PHC by the small number of study participants prior to hospitalisation raises questions about the PHC system and its capability to provide effective care for Pacific children. Research from multiple stakeholder perspectives is needed into the events and actions taken by health professionals in response to children's presentations with skin sores. Such research should also examine the possible causes of why some children with

skin sores recover with PHC in the community, while others subsequently require admission to hospital.

The issue of poor health for Pacific children in New Zealand has been documented for some time and addressing this is a priority. Hospitalisations for infections, including skin infections, are increasing.[1] Parents in the study were determined and committed, which are very positive and encouraging findings. Valuing parents' roles in the early management of children's illnesses and providing them with the necessary support can make a difference in children's health.

Study limitations

Mothers and children in this study do not fully reflect the broad ethnic diversity of the population of Pacific children and their families in New Zealand. Some children had also been in hospital 18 months prior to the interview, which may have limited their recall of events.

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COMPETING INTERESTS
None declared.