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The Management of Children’s Asthma in Primary Care

Are There Ethnic Differences in Care?

Volume One: Thesis

Suzanne Marie Crengle

A thesis submitted for the degree of Doctor of Philosophy,
The University of Auckland, 2008
Abstract

Background
Asthma is a common problem in New Zealand, and is associated with significant morbidity and costs to children, their families, and wider society. Previously published New Zealand literature suggested that Māori and Pacific children were less likely than NZ European children to receive asthma medications and elements of asthma education, had poorer knowledge of asthma, and experienced greater morbidity and hospitalisations. However, none of the previous literature had been specifically designed to assess the nature of asthma care in the community, or to specifically answer whether there were ethnic disparities in care. A systematic review of studies published in the international literature that compared asthma management among different ethnic groups drawn from community-based samples was undertaken. The results of this review suggested that minority ethnic group children were less likely to receive elements of asthma medication use, asthma education and self-management (action) plans.

Objectives
The primary objectives of the study were to:

- describe the use of medications, medication delivery systems, asthma education, and self-management plans in primary care for Māori, Pacific, and Other ethnic group children
- ascertain whether there were any ethnic disparities in the use of medications, medication delivery systems, asthma education, and self-management plans in primary care after controlling for differences in socio-economic position and other potential confounders.

Secondary objectives were to:
- describe the asthma-related utilisation of GP, after hours medical care, emergency departments, and hospital admissions among Māori, Pacific, and Other ethnic group children with asthma
- ascertain whether differences in medication use, the provision of asthma education, and the provision of self-management plans explained ethnic differences in health service utilisation.
Methods

A cross-sectional survey was conducted in Auckland, New Zealand. The caregivers of 647 children who were aged 2–14 years, had a diagnosis of asthma or experienced ‘wheeze or whistling in the chest’, and had experienced symptoms in the previous 12 months were identified using random residential address start points and door knocking. Ethnically stratified sampling ratios were used to ensure that approximately equal numbers of children of Māori, Pacific and Other ethnicity were enrolled into the study. A face-to-face interview was conducted with the caregivers of these children. Data was collected about: socio-demographic factors; asthma morbidity; asthma medications and delivery devices; exposure to, and experiences of, asthma education and asthma action plans; and asthma-related health services utilisation.

Results

In this study, the caregivers of 647 eligible children were invited to participate and 583 completed the interview, giving an overall completion rate of 90.1%. There were no ethnic differences in completion rates.

The overall use of inhaled corticosteroid medications had increased since previous New Zealand research was published. Multivariable modelling that adjusted for potential confounders did not identify ethnic differences in the use of inhaled corticosteroids or oral steroids. Some findings about medication delivery mechanisms indicated that care was not consistent with guidelines.

About 15% of participants reported they had not received asthma education from a primary care health professional. After adjusting for potential confounders there were no ethnic differences in the likelihood of having received asthma education from a health professional. Among those participants who had received education from a primary care health professional, significantly fewer Māori and Pacific caregivers reported receiving education about asthma triggers, pathophysiology and action plans. Lower proportions of Pacific (77.7%; 95% confidence interval (95%CI) 70.3, 85.1) and Māori (79.8%; 95% CI 73.6, 85.9) caregivers were given information about asthma triggers compared to Other caregivers (89.2%; 95% CI 84.9, 93.6; p=0.01). Fewer Māori (63.6%; 95% CI 55.7, 71.4) and Pacific (68.1%; 95% CI 60.1, 76.1) caregivers reported receiving information about pathophysiology (Other 75.9%; 95% CI 69.5, 82.3; p=0.05). Information about asthma action plans had been given to 22.7% (95% CI 15.5, 29.9) of Pacific and 32.9% (95% CI 25.3, 40.6) of Māori
compared to Other participants (36.5%; 95% CI 28.6, 44.3; p=0.04). In addition, fewer Māori (64.2%; 95% CI 56.1, 72.3) and Pacific (68.5%; 95% CI 60.1, 77.0) reported that the information they received was clear and easy to understand (Other 77.9%; 95% CI 71.8, 84.1; p=0.03). About half of those who had received education from a health professional reported receiving further education and, after adjustment for potential confounders, Pacific caregivers were less likely to have been given further education (odds ratio 0.57; 95% confidence interval 0.33, 0.96).

A minority of participants (35.3%) had heard about action plans and, after adjustment for potential confounders, Pacific caregivers were less likely to have heard about these plans (odds ratio 0.54; 95% confidence interval 0.33, 0.96). About 10% of the sample was considered to have a current action plan.

The mean number of visits to a GP for acute and routine asthma care (excluding after-hours doctors and medical services) in the previous twelve months were significantly higher for Pacific (3.89; CI 3.28, 4.60) and Māori (3.56; CI 3.03, 4.16) children than Other ethnic group children (2.47; CI 2.11, 2.85; p<0.0001).

Multivariable modelling of health service utilization outcomes (‘number of GP visits for acute and routine asthma care in the previous twelve months’, ‘high use of hospital emergency departments’, and ‘hospital admissions’) showed that adjustment for potential confounding and asthma management variables reduced, but did not fully explain, ethnic differences in these outcomes.

Māori children experienced 22% more GP visits and Pacific children 28% more visits than Other children (p=0.05). Other variables that were significantly associated with a higher number of GP visits were: regular source of care they always used (regression coefficient (RC) 0.24; p<0.01); lower household income (RC 0.31; p=0.004) and having a current action plan (RC 0.38; p=0.006). Increasing age (RC -0.04; p=0.003), a lay source of asthma education (RC -0.41; p=0.001), and higher scores on asthma management scenario (RC -0.03; p=0.05) were all associated with a lower number of GP visits.

Pacific (odds ratio (OR) 6.93; 95% CI 2.40, 19.98) and Māori (OR 2.60; 95% CI 0.87, 8.32) children were more likely to have used an emergency department for asthma care in the previous twelve months (p=0.0007). Other variables that had a significant effect on the use of
EDs in the multivariable model were: not speaking English in the home (OR 3.72; 95% CI 1.52, 9.09; p=0.004), male sex (OR 2.43; 95% CI 1.15, 5.15; p=0.02), and having a current action plan (OR 7.85; 95% CI 3.49, 17.66; p<0.0001). Increasing age was associated with a reduced likelihood of using EDs (OR 0.90; 95% CI 0.81, 1.00; p=0.05).

Hospitalisations were more likely in the Pacific (OR 8.94; 95% CI 2.25, 35.62) and Māori (OR 5.40; 95% CI 1.28, 23.06) ethnic groups (p=0.007). Four other variables had a significant effect on hospital admissions in the multivariable model. Participants who had a low income (OR 3.70; 95% CI 1.49, 9.18; p=0.005), and those who had a current action plan (OR 8.39; 95% CI 3.85, 18.30; p<0.0001) were more likely to have been admitted to hospital in the previous 12 months. Increasing age (OR 0.88; 95% CI 0.80, 0.98; p=0.02) and parental history of asthma (OR 0.39; 95% CI 0.18, 0.85; p=0.02) were associated with reduced likelihood of admission.

**Conclusions**

The study is a robust example of cross-sectional design and has high internal validity. The study population is representative of the population of children with asthma in the community. The three ethnic groups are also considered to be representative of those ethnic groups in the community. The study, therefore, has good representativeness and the findings of the study can be generalised to the wider population of children with asthma in the Auckland region.

The results suggested that some aspects of pharmacological management were more consistent with guideline recommendations than in the past. However, given the higher burden of disease experienced by Māori and Pacific children, the lack of observed ethnic differences in the use of preventative medications may reflect under treatment relative to need. There are important ethnic differences in the provision of asthma education and action plans. Future approaches to improving care should focus on interventions to assist health professionals to implement guideline recommendations and to monitor ethnic disparities in their practice. Asthma education that is comprehensive, structured and delivered in ways that are effective for the people concerned is needed.
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Professor Bruce Arroll and Dr Paul Brown have been the supervisors for this PhD thesis. Thank you both for your guidance and patience.

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He mihi nui, he mihi tino aroha ki a koutou katoa.

Kua ea.
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<td>95% confidence interval</td>
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<tr>
<td>$\beta_2$ agonists</td>
<td>$\beta_2$ adrenoreceptor agonists</td>
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<td>A&amp;E</td>
<td>Accident and Emergency</td>
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<td>Accident and Medical Centre</td>
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<td>After hours medical care</td>
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<td>CG prioritised</td>
<td>Caregiver prioritised ethnicity</td>
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<td>DHB</td>
<td>District Health Board</td>
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<td>ED(s)</td>
<td>Emergency department(s)</td>
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<td>General Medical Services benefit</td>
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<tr>
<td>GP</td>
<td>General Practitioner</td>
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<td>Health Research Council of New Zealand</td>
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<td>IOM</td>
<td>Institute of Medicine</td>
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<td>ISAAC</td>
<td>International Study of Asthma and Allergies in Childhood</td>
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<tr>
<td>KMR</td>
<td>Kaupapa Māori Research</td>
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<tr>
<td>LABA</td>
<td>Long acting $\beta_2$ agonists</td>
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<td>LTRA</td>
<td>Leukotriene receptor antagonists</td>
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<td>MDIs</td>
<td>Metered dose inhalers</td>
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<tr>
<td>M:nM</td>
<td>Māori:non-Māori (ratio of Māori to non-Māori)</td>
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<td>MPH</td>
<td>Master of Public Health</td>
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<tr>
<td>NAEPP</td>
<td>National Asthma Education and Prevention Program</td>
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<tr>
<td>ns</td>
<td>Not significant</td>
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<td>NZE</td>
<td>New Zealand European</td>
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<td>OR</td>
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<td>PAH</td>
<td>Potentially avoidable hospitalisations</td>
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<td>Peak expiratory flow rate</td>
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<td>Treaty of Waitangi</td>
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