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ORIGINAL RESEARCH

Factors associated with ownership and use of written asthma action plans in North-West Melbourne

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KEYWORDS

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Summary

Purpose: Written asthma action plans (WAAPs) have become a core component of asthma management in Australia. We investigated ownership, utilisation and factors associated with ownership of asthma action plans by caregivers.

Methods: 443/776 (57%) caregivers of children aged 2–14 years with asthma were identified from 32 GP clinics as part of a randomised controlled trial (RCT), and completed self-administered questionnaires.

Results: Only 29% of participants owned a WAAP, while 13% possessed verbal instructions, and 56% had no plan. An asthma action plan for children, which was developed by a general practitioner (GP) was more likely to comprise verbal instructions ($p = 0.001$), while action plans developed by paediatricians were more likely to be written ($p < 0.001$). Just over one half of caregivers (59%) reported discussing their child's action plan the last time they visited their doctor for asthma. Factors associated with WAAP ownership included nights waking ($p = 0.013$), self reported severity ($p = 0.001$), and days lost from school ($p = 0.037$). Children who had seen a GP in the

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last 3 months for asthma, or who had been to the Emergency Department (ED) or hospital were more likely to possess a WAAP ($p < 0.001$). Caregivers who were less satisfied with their child's asthma control were more likely to own a WAAP ($p = 0.037$). Caregivers with any action plan found it useful and 82% reported using their action plan for management of an acute attack. However, caregivers with a WAAP were more likely to adhere to the plan for an acute attack compared to caregivers with verbal instructions (OR = 4.5, $p < 0.05$). Caregivers with a WAAP were more knowledgeable about asthma ($p = 0.002$), better able to recognise the difference between preventer and reliever medications ($p = 0.01$), and better able to recognise an asthma attack ($p = 0.006$).

Conclusions: Ownership of WAAPs in this group was still too low. Importantly, caregivers with written instructions were more knowledgeable about asthma and more likely to report following the action plan during an asthma attack.

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Introduction

Written asthma action plans (WAAPs) have become a core component of asthma management in Australia. Ownership of written instructions for asthma management has been associated with a reduced risk of asthma mortality [1]. Similarly reductions in asthma morbidity have been reported when a WAAP is part of asthma management that includes education and regular review [2].

It has been suggested that health benefits may not be realised by all patients with asthma who are provided with written instructions [3]. We do not know what it is about WAAPs that are beneficial nor whether they are mostly useful for day to day management of asthma, or management of acute attacks [3].

As part of a larger randomised controlled trial of evidence-based asthma guidelines delivered to general practitioners via an education program, we took a combined quantitative and qualitative approach to investigate factors associated with ownership of written instructions for asthma, and the use and attitudes toward written asthma action plans by parents caring for children with episodic asthma. This paper describes the quantitative arm of the study. The qualitative findings will be reported elsewhere.

Methods

This study draws on information from baseline data collected as part of an RCT of asthma guidelines implemented within an education package delivered to general practitioners (GPs) in Melbourne's Northern and North Western suburbs. Details of the RCT have been presented previously at conference (Proceedings of the 2002 General Practice and Primary Health Care Research Conference, pg.

80) and will be published elsewhere. Briefly however (Appendix A), 65 GPs from 32 clinics in Melbourne's Northern and North Western suburbs were recruited through participating Divisions of General Practice. GPs were randomised into one of three intervention groups; the first group received a copy of asthma best-practice guidelines and attended two half-day workshops on management of asthma, the second group received a copy of asthma best-practice guidelines, and the third group received ENT best-practice guidelines and attended two half-day workshops on treatment of these conditions.

Paediatric asthma patients managed by the GPs participating in the RCT were then identified from computerised medical records. Three practices were not computerised and patients were identified from local pharmacy records. The caregivers of children aged 2–14 years were mailed a questionnaire package at baseline and six months after the intervention to determine the health benefits to the children with asthma and their families.

The questionnaire package included an asthma knowledge questionnaire [6], questions about ownership and use of asthma action plans (Appendix B), as well as demographic and socio-economic status.

Data analysis

STATA version 7.0 (Stata Corporation, Texas) was used for analysis of questionnaire data. Categorical data were analysed using contingency tables. Chi-Square (χ^2), Odds Ratios and confidence intervals were used to determine associations between groups for ownership and use of asthma action plans. T-tests were used to determine differences between groups for asthma knowledge. A p -value ≤ 0.05 was required for statistical significance.

Table 1 Summary of results.Socio-demographic and general characteristics ($N = 443$)

- 21% completed undergraduate and 13% postgraduate degrees
- Only 4% out of 443 parents were from culturally and linguistically diverse (CALD) communities
- 27% of families earn <A\$20,000, and 47% >A\$50,000
- About 60% understand changes in the airways due to asthma
- Nearly a third of children visited GP or ED for treatment of an acute asthma attack, yet the vast majority reported mild asthma (using night waking and self-reported severity), and a high level of satisfaction with level of control (57% very satisfied and 36% quite satisfied)

Ownership of Written Asthma Action Plans (WAAP) ($N = 443$)

Only 29% Own WAAP, of those:

- 59% discussed their plan during last GP/hospital visit
- 82% use WAAP in acute attacks

Factors associated with WAAP Ownership ($N = 443$)

- Parental reporting of severity ($\chi^2 = 15.1$, $df = 2$, $p = 0.001$)
- Nights waking ($p = 0.02$)
- Days lost ($\chi^2 = 19.3$, $df = 4$, $p = 0.04$)
- ED visit in the last 3 months ($\chi^2 = 20.1$, $df = 1$, $p < 0.001$)
- GP visit in the last 3 months ($\chi^2 = 25.8$, $df = 1$, $p < 0.001$)
- Better Knowledge ($t(417) = 3.1$, $p = 0.002$)
- Better able to recognise acute attacks ($\chi^2 = 10.1$, $df = 2$, $p = 0.006$)
- Better able to recognise the difference between preventer & reliever medications ($\chi^2 = 7.3$, $df = 1$, $p = 0.006$)

Results

Table 1 summarises the results. A total of 443 families completed the baseline questionnaire. English was the primary language spoken at home by caregivers (86%) and children were predominately Australian born (95%). Most caregivers had completed high school (50%) or tertiary education (39%), but 8% had not completed high school. Only 22 caregivers (5%) reported that unemployment benefits were their primary source of income. One third of households had at least one adult smoker, but most participants reported that no one smoked in or outside of the home (65%). Just less than one quarter (24%) of caregivers (not including partners) reported that they also had asthma.

Ownership of asthma action plans

Only 29% of children possessed a WAAP, while 13% possessed verbal instructions, 56% had no plan for the management of asthma, and 2% did not answer this question in the questionnaire.

All caregivers with either a verbal or written action plan reported that they found the action plan useful and 82% reported using their action plan for management of an acute attack. However, caregivers with a WAAP were more likely to adhere to their plans for management of an acute attack com-

pared with caregivers given verbal instructions only (OR = 4.5, $p < 0.05$).

Asthma knowledge in this sample was quite low. Caregivers with a WAAP answered 56.8% of questions correctly (Mean \pm Standard Deviation = 12.5 \pm 0.18, out of 31 questions) compared with caregivers who did not own a WAAP who correctly answered 52.3% of questions (11.5 \pm 0.23) ($t(417) = 3.1$, $p = 0.002$). This difference in knowledge although statistically significant, would not actually seem clinically important. Furthermore, higher proportion of caregivers with WAAPs was able to recognise the difference between preventer and reliever medications ($\chi^2 = 7.3$, $df = 1$, $p = 0.007$), and recognise an asthma attack ($\chi^2 = 10.1$, $df = 2$, $p = 0.006$).

Factors associated with WAAP ownership

Who generated the action plan?

Children who had seen a GP in the last 3 months for asthma ($\chi^2 = 25.8$, $df = 1$, $p < 0.001$), or who had been to the emergency department (ED) or hospital ($\chi^2 = 20.1$, $df = 1$, $p < 0.001$) were more likely to possess a WAAP. Children whose action plans were developed by a GP were more likely to report being given verbal instructions ($\chi^2 = 13.8$, $df = 1$, $p = 0.001$), while plans developed at a hospital or by paediatricians were more likely to be written ($\chi^2 =$

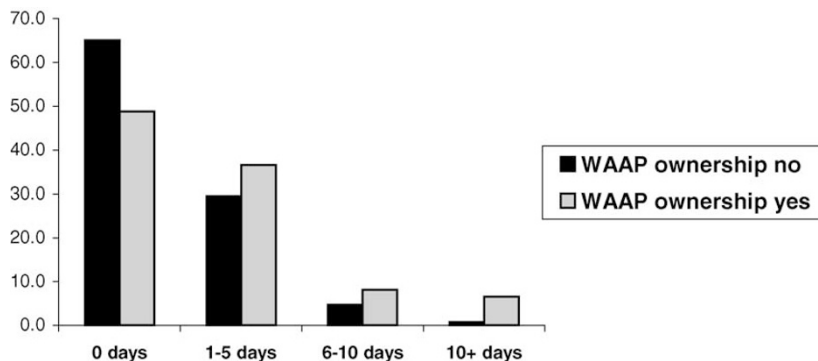


Figure 1 Work/school days missed because of asthma and (%) ownership of written asthma action plan (WAAP) ($P = 0.04$).

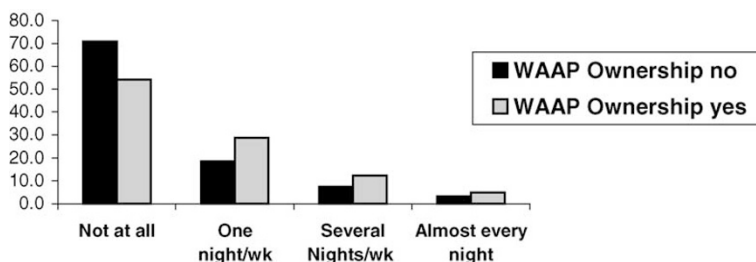


Figure 2 Frequency of night waking because of asthma symptoms and (%) ownership of written asthma action plan (WAAP) ($P = 0.02$).

22.4, $df = 1$, $p < 0.001$). Just over half (59%) of parents who owned a WAAP reported discussing their action plan the last time they visited their doctor for asthma (Table 1).

Asthma severity

Written instructions were more likely to be possessed by children who reported missing one or more days of school (Fig. 1) ($\chi^2 = 19.3$, $df = 4$, $p = 0.001$) or who woke several nights (Fig. 2) or more a week ($\chi^2 = 10.7$, $df = 3$, $p = 0.013$). However, 30

children (7%) who reported waking several nights a week or more (i.e. had persistent asthma) had not been given a WAAP. Caregivers were more likely to have a WAAP if they reported their child’s asthma was moderate (Fig. 3) or severe ($\chi^2 = 15.1$, $df = 2$ $p = 0.001$), or if they were not satisfied with their child’s asthma control ($\chi^2 = 9.5$, $df = 3$ $p = 0.037$).

Demographic and socio-economic status

There were no differences in ownership of action plans based on demographic or socioeconomic

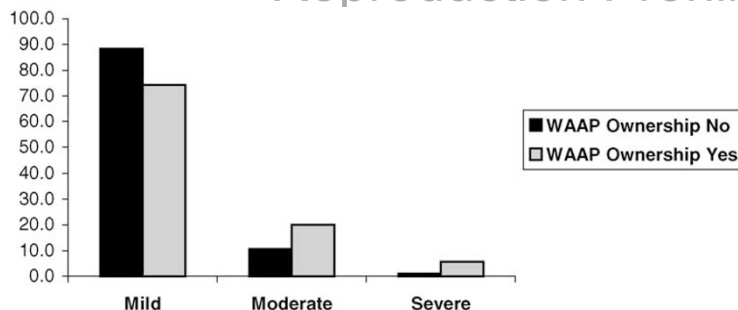


Figure 3 Self-reported asthma severity and (%) ownership of written asthma action plan (WAAP) ($P = 0.001$).

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factors including employment, caregiver education, household income or child's country of birth.

Discussion

Ownership of asthma action plans in this group was still too low, and some children with persistent asthma did not possess any action plans for their asthma. Importantly, caregivers with written instructions were more knowledgeable about asthma, and more likely to report following the action plan during an asthma attack.

National guidelines for management of asthma have consistently recommended that all individuals with asthma should have a written individualised plan of how to treat deteriorating asthma. However, studies of WAAP ownership in the community have shown that WAAP ownership remains sub-optimal, with rates of ownership ranging between 34.7% in a NSW study [7] and 13.3% in Melbourne adults [8]. As with the earlier Melbourne study [9] verbal instead of written instructions for asthma were more likely to be given to participants by GPs. However, in the current study, more than half the caregivers who had a WAAP reported discussing their child's action plan at their last medical visit. This may reflect more frequent changes in medication regimens for children with asthma, whereas adults with asthma might be expected to be on a more stable medication regimen.

While there is evidence for the effectiveness of written asthma action plans [2], especially in combination with education and regular review, a potential confounding factor is whether patients actually use their written action plans. Qualitative reports of patients use of and attitudes toward WAAPs suggest they are often not utilised as intended by adult patients [5], or are not utilised at all [4]. In the current study, more than three quarters of participants with an action plan reported using their action plan for management of an asthma attack, but we were unable to determine whether patients followed their plans accurately, or if they had modified the instructions as has been reported previously in qualitative studies of adult asthma patients [5].

Caregivers in this study who had been given written instructions were more knowledgeable about asthma, more likely to know the difference between reliever and preventer medications and better able to recognise an asthma attack. While there

are age related developmental goals for asthma management, it can only benefit both child and caregiver that the WAAP be used to educate the child about asthma management. We have reported previously that caregivers who are more knowledgeable about asthma have children who are more knowledgeable about asthma [9], and asthma education has been shown to reduce asthma morbidity [10]. Subsequently, it might benefit families if WAAPs utilised language that could be understood by primary school aged children. This was also highlighted in a recent study [11], which suggested that health care providers who incorporate information that parents have given them will be more successful in creating a mutually formulated treatment plan.

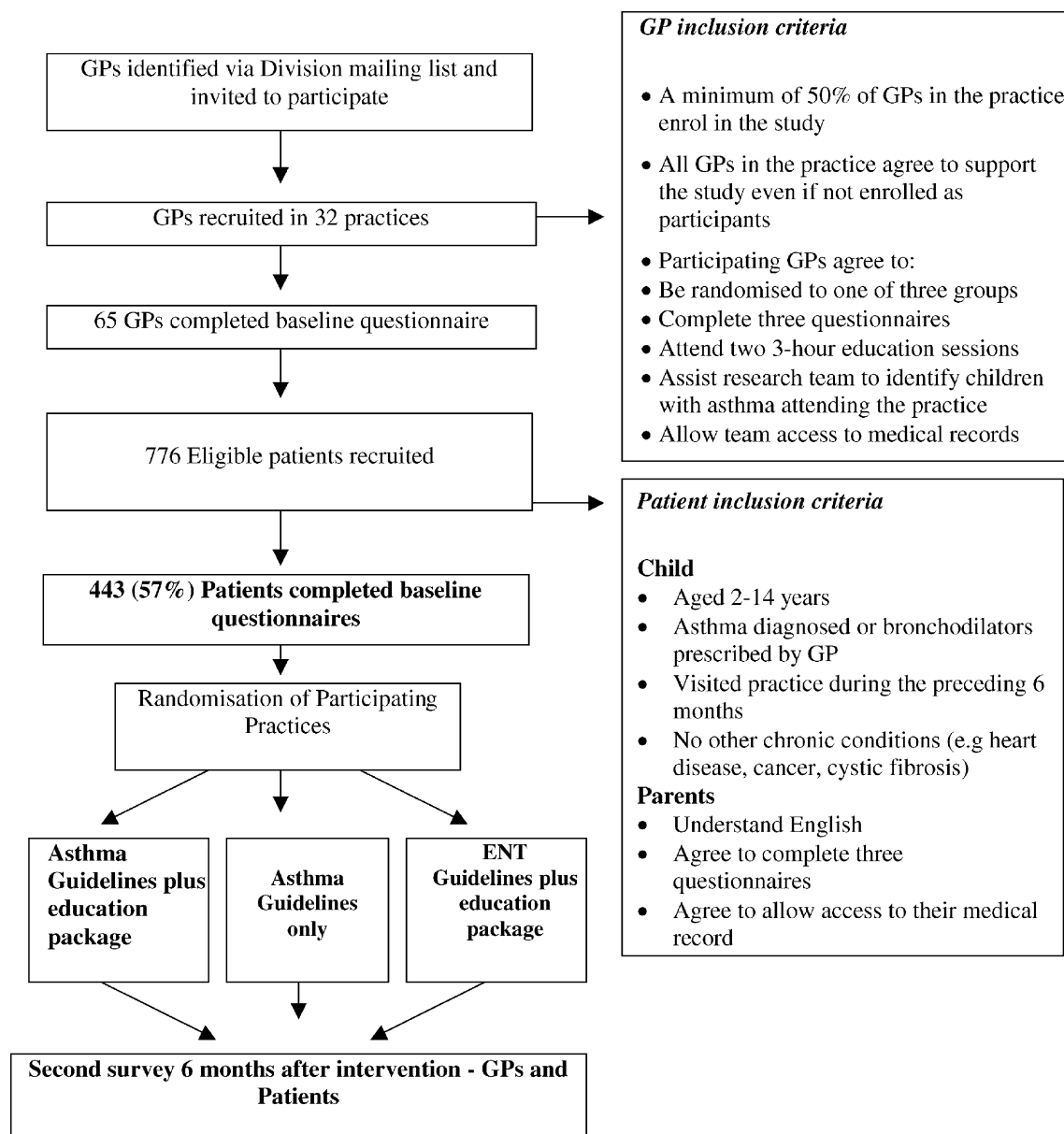
The limitations of this study are the same for many cross-sectional studies and we are unable to draw causal inferences. Furthermore, participants were drawn from a general practice population and had predominately episodic asthma with mild to moderate attacks, so whether the factors related to ownership and use are the same as those for patients with persistent asthma or those who have had severe attacks needs to be investigated further.

This study highlights a number of opportunities by which health professionals can improve their management of paediatric asthma. A small number of children with persistent asthma symptoms did not possess a written asthma action plan. As a group, too few children possessed a written asthma action plan, with GPs being less likely than hospital doctors or specialists to provide a written plan for children. Similarly, too few families reported discussing their action plan with their doctor at their last consultation. Yet, there were clear benefits to patients with written instructions in terms of asthma knowledge and management of acute attacks. Ownership and use of written asthma action plans needs to be improved in line with best practice guidelines.

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Appendix A. Study methodology and flow chart



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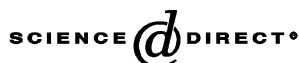
Appendix B. Questions about asthma action plan

ACTION PLAN			
An <i>Asthma Action Plan</i> is a written set of instructions, which tells you what medicines your child should be taking and what to do if your child is having an asthma attack or their symptoms are getting worse. An <i>Action Plan</i> is sometimes called a <i>Management Plan</i> . (Please tick <u>only one</u> box per question)			
1. Do you have an Asthma Action Plan?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	(Go to Part C)
2. Is the Asthma Action Plan written down?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
3. Where did you get it from?	Your child's GP <input type="checkbox"/> Hospital/Paediatrician <input type="checkbox"/> Other, please specify..... <input type="checkbox"/>		
4. Did your GP or clinic nurse discuss the Asthma Action Plan the last time you attended the clinic for asthma?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
5. Do you use the Asthma Action Plan for your child's everyday asthma care?	<input type="checkbox"/> All the time	<input type="checkbox"/> Sometimes	<input type="checkbox"/> Never
6. Has your child had an asthma attack in the last THREE MONTHS	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
If yes, did you use your Action Plan?	<input type="checkbox"/> Yes	<input type="checkbox"/> No	
7. How useful did you find the Asthma Action Plan? (Please circle the most appropriate number from 1 to 5 with one being the least useful and five being the most useful):	Not useful _____ Very useful 1 2 3 4 5		

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