

Indigenous healthcare worker involvement for Indigenous adults and children with asthma (Review)

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[Intervention Review]

Indigenous healthcare worker involvement for Indigenous adults and children with asthma

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ABSTRACT

Background

Asthma education is regarded as an important step in the management of asthma in national guidelines. Racial, ethnicity and socio-economic factors are associated with markers of asthma severity, including recurrent acute presentations to emergency health facilities. Worldwide, indigenous groups are disproportionately represented in the severe end of the asthma spectrum. Appropriate models of care are important in the successful delivery of services, and are likely contributors to improved outcomes for people with asthma.

Objectives

To determine whether involvement of an Indigenous healthcare worker (IHW) in comparison to absence of an IHW in asthma education programs, improves asthma related outcomes in indigenous children and adults with asthma.

Search methods

We searched the Cochrane Central Register of Controlled Trials (CENTRAL), the Cochrane Airways Group Specialised Register, MEDLINE and EMBASE databases, review articles and reference lists of relevant articles. The latest search was in January 2011.

Selection criteria

All randomised controlled trials comparing involvement of an Indigenous healthcare worker (IHW) in comparison to absence of an IHW in asthma education programs for indigenous people with asthma.

Data collection and analysis

Two independent review authors selected data for inclusion, a single author extracted the data. Both review authors independently assessed study quality. We contacted authors for further information. As it was not possible to analyse data as "intention-to-treat", we analysed data as "treatment received".

Main results

One study fulfilled inclusion criteria involving 113 children randomised to an asthma education programme involving an IHW, compared to a similar education programme without an IHW. Eighty eight of these children completed the trial. Parents' asthma knowledge score (mean difference (MD) (7.49; 95% CI 5.52 to 9.46), parents' asthma skill score (MD 0.98; 95% CI 0.52 to 1.44) and days absent from school (100% school-aged children in the intervention group missed <7 days, 21% of controls missed 7-14 days, difference = 21%, 95% CI 5-36%) were significantly better in the intervention group compared to controls. There was no significant difference in mean number of exacerbations (per year) between groups. There was no difference in quality of life or children's asthma skill score; both were limited to one study only and the direction favoured IHW group. There were no studies in adults.

Authors' conclusions

The involvement of IHW in asthma programs targeted for their own ethnic group in one small trial was beneficial in improving most, but not all asthma outcomes in children with asthma. It is very likely that involvement of an IHW is beneficial. However as exacerbation frequency was not significantly different between groups, we cannot be confident of the results in all settings. Nevertheless, given the complexity of health outcomes and culture as well as the importance of self-determination for indigenous peoples, the practice of including IHW in asthma education programs for indigenous children and adults with asthma is justified, but should be subject to further randomised controlled trials.

PLAIN LANGUAGE SUMMARY

Indigenous healthcare worker involvement for indigenous adults and children with asthma

World-wide indigenous people with asthma are disproportionately represented in the severe end of the disease spectrum. Appropriate models of care are important in the successful delivery of services, and are likely contributors to improved outcomes for people with asthma. In this review, we examined if involvement of an indigenous healthcare worker (IHW) (when compared to absence of an IHW) in asthma education programs improves asthma related outcomes in Indigenous children and adults with asthma. There was only one study involving 113 people eligible for inclusion in this review. The participants showed improvement in the patient's asthma knowledge score, the parent's asthma skill score and a reduction in the number of days missed from school in children who were cared for by an indigenous healthcare worker. However as exacerbation frequency was not reduced and there was only a single, small study, we cannot be confident of the results although we think it is likely that the involvement of IHW is beneficial. Nevertheless, given the complexity of health outcomes and culture as well as the importance of self-determination for indigenous peoples, the practice of including IHW in asthma education programs for indigenous children and adults with asthma is justified, but should be subject to further randomised controlled trials

BACKGROUND

Asthma education for people with asthma is regarded as an important step in the management of asthma in national asthma guidelines (BTS 2005; Coughlan 2000). Asthma education, defined as the provision of disease related and management information on asthma, encompasses various formats that includes face-to-face encounters, group sessions, outreach and home visits, provision of asthma action plans, education of recognition of loss of asthma control and self management skills (BTS 2005). Most of these are addressed (or are being addressed) in other Cochrane reviews (Bailey 2009; Gibson 2002a; Gibson 2002b; Powell 2002; Wolf 2002; Toelle 2004) from the Cochrane Airways Group.

Racial and socio-economic factors are associated with asthma severity and recurrent acute presentations to emergency health facilities (de Oliveira 1999; Sin 2002). The reasons for this are unclear; contributing factors are arguably likely to include broad service delivery issues rather than a reflection of intrinsic asthma severity (Chang 2000; Enarson 1999). Other cultural influences on the management of asthma include symptom perception and understanding of disease and self management (Enarson 1999). Appropriate models of care are important in the successful delivery of healthcare services, and contribute to improved care of people with asthma (Chang 2002; Partridge 2000). Models of care should be culture appropriate (Enarson 1999). As outlined

by Swartz and Dick, the World Health Organisation model of healthcare for chronic diseases in low-income settings recognises that “health care should facilitate an ongoing relationship between provider and patient and help patients to make full use of their own and their community’s resources for health” (Swartz 2002). Not surprisingly, in the health literature for indigenous groups, the model of care for chronic diseases in indigenous people includes the involvement of indigenous healthcare workers (IHWs) (Chino 2006; Hamdorf 1996; NHMRC 2005). Amongst other factors, involvement of IHWs would facilitate this relationship between patient and the provider. Furthermore, involvement of IHWs could reduce the prejudices and inequities that exist in some sections of healthcare systems (Eades 2000) and contribute to capacity building of the local community, a key component of the Ottawa Charter for Health Promotion (WHO 1986). However, while this is indisputably culturally important, the additional human resources involve a cost for the health system. This cost must be weighed against the available evidence of benefits to patients, their communities and the broader healthcare system.

The definition, background training and tasks performed by IHWs varies from state to state and country to country. Country specific definitions of ‘indigenous’ status also vary. These terms are not always universally accepted or used and in fact, remain a highly contested term (Nettelton 2007). “In Australia, accepted terminology for indigenous peoples includes ‘Australian Aboriginal and Torres Strait Islander Peoples’, in the USA and Canada the term ‘First Nations’ is used to describe the Indian, Métis, and Inuit populations” (Cunningham 2003). “In Hawaii, native Hawaiian finds favour” and “the Maori of New Zealand use ‘Tangata Whenua’ or ‘people of the land’ in preference to Maori” (Cunningham 2003). Although cognisant of the various preferences by different groups, an encompassing term is required for this review. We have chosen the term ‘indigenous’ which is defined in recognition of “the experiences shared by a group of people who have inhabited a country for thousands of years, which often contrast with those of other groups of people who reside in the same country for a few hundred years” (Cunningham 2003).

Outcomes of asthma education programs can be variably defined. Arguably the most important asthma education outcome is the provision of self management so as to prevent death and morbidity from acute exacerbations. Other outcomes are reduction of day to day morbidity from asthma-related symptoms and objective measurements of asthma severity (BTS 2005).

A systematic review to determine whether involvement of an indigenous healthcare worker (IHW) improves asthma related outcomes in Indigenous children and adults with asthma will be useful to guide clinical practice and health policy.

OBJECTIVES

To determine whether involvement of an indigenous healthcare worker (IHW) in comparison to the absence of an IHW in asthma education programs, improves asthma related outcomes in Indigenous children and adults with asthma.

METHODS

Criteria for considering studies for this review

Types of studies

All randomised controlled trials comparing involvement of an indigenous healthcare worker (IHW) in comparison to absence of an IHW in asthma education programs for indigenous people with asthma.

Types of participants

Indigenous children and adults with classical asthma (recurrent wheeze, dyspnoea or bronchodilator responsiveness) that responds to beta₂ agonists.

Exclusion criteria: eosinophilic bronchitis, asthma related to an underlying lung disease such as bronchiectasis and chronic obstructive airway disease, or diagnostic categories such as ‘cough variant asthma’ and ‘wheezy bronchitis’ if controversies exist. Studies that involved minority groups but not Indigenous to the country of study were excluded from the 2011 update.

Types of interventions

All randomised controlled studies involving comparisons of IHW versus no IHW in asthma education programs. It was planned that trials that included the use of other education and other interventions would have been included if all participants had equal access to such interventions. An education programme is defined as a programme which transfers information about asthma in any form.

Types of outcome measures

Primary outcomes

Proportion of participants who had asthma exacerbations during follow up.

Secondary outcomes

1. Proportions of participants not substantially improved at follow up
2. Mean difference in asthma related outcome measures
3. Proportions experiencing adverse effects (from medications, etc)
4. Adherence outcomes
5. Asthma knowledge factors
6. Economic data

It was planned that for the proportions of participants, the mean clinical improvement would have been determined using the following hierarchy of assessment measures (i.e. if two or more assessment measures are reported in the same study, the outcome measure that is listed first in the hierarchy would have been used).

- I) Death, hospitalisation, acute presentations to an emergency facility for asthma
- ii) Rescue courses of oral corticosteroids
- iii) Symptomatic (Quality of life, Likert scale, asthma diary, visual analogue scale, asthma control scores) - assessed by the patient (adult or child)
- iv) Symptomatic (Quality of life, Likert scale, asthma diary, visual analogue scale, asthma control scores) - assessed by the parents/carers.
- v) Symptomatic (Likert scale, visual analogue scale, asthma control scores) - assessed by clinicians.
- vi) Indices of spirometry, peak flow, airway hyper-responsiveness, exhaled nitric oxide, sputum eosinophils
- vii) Beta-agonist used
- viii) Days of lost school days or work days

Search methods for identification of studies

We used the following topic search strategy to identify the relevant randomised controlled trials listed on the electronic databases:

“asthma”, all as (textword) or (MeSH) AND “indigenous” OR “aboriginal” OR “minority groups” AND “education” OR “self management” OR “self-management”

For the full strategies for each database please see [Appendix 1](#).

We identified trials from the following sources.

1. The Cochrane Central Register of Controlled Trials (CENTRAL).
2. The Cochrane Airways Group Specialised Trials Register.
3. MEDLINE (1966 to current). Topic search strategy combined with the RCT search filter as outlined in the Airways Group module.
4. OLDMEDLINE (1950 to 65). Topic search strategy combined with the RCT search filter as outlined in the Airways Group module.
5. EMBASE (1980 to current). Topic search strategy combined with the RCT search filter as outlined in the Airways Group module.
6. The list of references in relevant publications.

7. Written communication with the authors of trials included in the review.

Latest search was performed in January 2011.

Data collection and analysis

Selection of studies

Retrieval of studies: From the title, abstract, or descriptors, two review authors (AC, AB) independently reviewed literature searches to identify potentially relevant trials for full review. Searches of bibliographies and texts were conducted to identify additional studies. From the full text using specific criteria, both review authors independently selected trials for inclusion. Any disagreement would have been resolved by consensus.

Data extraction and management

We reviewed trials that satisfied the inclusion criteria and recorded the following information: study setting, year of study, source of funding, patient recruitment details (including number of eligible participants), inclusion and exclusion criteria, other symptoms, randomisation and allocation concealment method, numbers of participants randomised, blinding (masking) of participants, care providers and outcome assessors, type of education, dose and type of intervention, duration of therapy, co-interventions, numbers of patients not followed up, reasons for withdrawals from study protocol (clinical, side effects, refusal and other), details on side effects of therapy, and whether intention-to-treat analyses were possible. A single author (AC) extracted data and entered this into [RevMan 5](#) for meta-analysis. We requested further information from the authors if required.

Assessment of risk of bias in included studies

We assessed the risk of bias according to recommendations outlined in the Cochrane Handbook for the following items:

1. Random sequence generation (selection bias)
2. Allocation concealment (selection bias)
3. Blinding (performance bias and detection bias)
4. Incomplete outcome data (attrition bias)
5. Selective reporting (reporting bias)

We also recorded other sources of bias. We graded each potential source of bias as low, high or unknown risk of bias.

Data synthesis

We included the results from studies that met the inclusion criteria and reported any of the outcomes of interest in the meta-analyses. We planned to calculate the summary weighted risk ratio and 95% confidence interval (fixed-effect model) using [RevMan](#)

5. We assumed that outcome indices were normally distributed continuous variables, and therefore estimated the mean difference in outcomes were estimated (mean difference). When studies reported continuous outcomes using different measurement scales, we planned to estimate the standardised mean difference.

For the dichotomous outcome variables of each individual study, we had planned to calculate odds ratio using a modified intention-to-treat analysis (i.e. assumed that participants not available for outcome assessment have not improved and hence adopting a conservative estimate of effect). However this was not possible and data was analysed as “treatment received”.

We planned to use only data from the first arm of cross-over studies in meta analysis (thus essentially treating cross-over trials as parallel studies). Numbers needed to treat to benefit (NNTB) would have been calculated from the pooled OR and its 95% CI applied to a specified baseline risk using an online calculator (Cates 2003).

Subgroup analysis and investigation of heterogeneity

We planned sub-group analysis using the following subgroups:

- a) adults versus children;
- b) different types of education;
- c) different settings (rural versus non-rural, wealthy countries versus low-income countries).

We tested heterogeneity between the studies using a chi-squared test. We planned to include the 95% confidence interval estimated using a random-effects model if we had concerns about statistical heterogeneity.

Sensitivity analysis

We planned on undertaking sensitivity analyses to assess the impact of the potentially important factors on the overall outcomes:

- a) study quality (adequate allocation concealment and blinding);
- b) variation in the inclusion criteria;
- c) differences in outcome measures;
- d) analysis using random effects model; and
- e) analysis by “treatment received”.

RESULTS

Description of studies

See: [Characteristics of included studies](#); [Characteristics of excluded studies](#); [Characteristics of studies awaiting classification](#).

Results of the search

The Airways Group search identified 114 potentially relevant titles in the original search in 2006. After assessing the abstracts, we retrieved 13 papers and we considered 11 potential studies (*see* ‘[Characteristics of excluded studies](#)’). In updated searches (nine in 2007 and five in 2008), no new studies were included but on-going studies were identified. The 2010 search identified two potential papers of which one we included (Valery 2010). Data for the analysis were obtained from study authors. The 2011 search identified seven potential papers, four were retrieved for full review.

Included studies

The sole included study was performed in a remote Indigenous region where intervention consisted of home visits by an Indigenous Health Worker. The study had a large attrition rate (113 randomised, 88 completed study). The intervention details in the ‘IHW involvement’ group versus ‘no IHW involvement’ group are described in the [Characteristics of included studies](#) table.

We included a single trial in the original review (La Roche 2006) that only partially (*see* below) fulfilled the study eligibility criteria. The corresponding author of the trial kindly provided additional information (La Roche 2006). This trial included involvement by African-American and Hispanic healthcare providers in the intervention group of children who were of African-American or Hispanic ethnicity (La Roche 2006). When we conducted the original review and subsequent updates to 2007, this was only study using healthcare workers of a corresponding ethnic minority to that of the patients and therefore we included it in the review, although strictly speaking, children were not indigenous (to the country where the study was carried out). However, since 2007, several other papers examining the involvement of ethnic minorities in people of the same ethnic minority, but who are not indigenous have been published (Fisher 2009, Krieger 2009, Flores 2009). We believe this should be the subject of another Cochrane review, and we have since written a review that will be updated to incorporate these three trials (Bailey 2009). We excluded La Roche 2006 from the review from the 2011 update for these reasons.

There were no eligible studies in adults.

Risk of bias in included studies

Figure 1 summarises the findings. While the study was randomised, the main risk of bias is in the lack of blinding in some outcomes and insufficient sample size for the primary outcome.

Figure 1. Methodological quality summary: review authors' judgements about each methodological quality item for each included study.

Valery 2010	+	+	+	-	-	-	?	+	?
	Random sequence generation (selection bias)	Allocation concealment (selection bias)	Blinding (performance bias and detection bias): Exacerbations	Blinding (performance bias and detection bias): Asthma knowledge and skills	Blinding (performance bias and detection bias): Quality of life	Blinding (performance bias and detection bias): Days missed school	Incomplete outcome data (attrition bias)	Selective reporting (reporting bias)	Other bias

Effects of interventions

Although we presented results from the single included study in forest plots, results could not be pooled.

1. Primary outcome: Asthma exacerbations

(a) The mean number of acute presentations to an emergency or health facility for asthma

There was no significant difference between the groups (difference between groups 0.30; 95% CI -0.17 to 0.77) [Analysis 1.1](#).

The intervention group had more severe asthma at baseline ([Valery 2010](#)), which could have influenced the results.

(b) Number of children hospitalised for asthma during study period

There was no significant difference between the groups (OR 1.58; 95% CI 0.37 to 6.79; [Analysis 1.2](#)).

2. Secondary outcome: Asthma knowledge factors

These outcomes were derived from asthma assessment questionnaires.

(a) Mean score for asthma knowledge

Parents' asthma knowledge score was significantly higher in the 'IHW involvement' group compared to controls (difference between groups 7.49; 95% CI 5.52 to 9.46; [Analysis 2.1](#)). Children's asthma knowledge score was not reported.

(b) Mean score for asthma skills

For parents' asthma skills score the intervention group was significantly better than the control group (MD 0.98; 95% CI 0.52 to 1.44; [Analysis 2.2](#)). Children's score was not reported.

(c) Quality of Life

Carer asthma-QoL was not significantly different between groups (0.25; 95% CI -0.39 to 0.89; [Analysis 2.3](#)), although favouring the IHW group. Children's QoL was not reported.

3. Other outcomes

[Valery 2010](#) reported a significant improvement in possession and interpretability of asthma action plans, as well as 'days off school' in the intervention group compared to controls; "100% school-

aged children in the intervention group missed <7 days, 21% of controls missed 7-14 days, difference = 21% (95%CI 5-36%)". There was insufficient data for sensitivity analysis to be performed.

DISCUSSION

We identified one randomised controlled trial comparing IHW with no IHW involvement for asthma education program in children. There was no difference in exacerbations between groups. However in all other outcomes, the group with IHW involvement in the asthma education program either had significantly better outcomes or the direction of effect was in favour of the IHW group compared to the control group.

Our findings are consistent with data from several papers ([Fisher 2009](#); [Flores 2009](#); [Krieger 2009](#); [La Roche 2006](#)) that have largely shown the beneficial effects of health or community workers involvement in minor ethnic groups with poorer asthma outcomes. In this updated review we restricted our group to Indigenous groups (given the rather unique issues faced by Indigenous groups) and did not include ethnic minority groups (i.e. people originating from a country other than the country in which the trial was conducted) in this review and arguably should be addressed in a different review.

This review is considerably limited by the very small sample size and the presence of only a single study with most outcomes unblinded. Particularly for the primary outcome (exacerbations), the sample size is likely far too small. There were no data relevant to adults.

AUTHORS' CONCLUSIONS

Implications for practice

The involvement of IHW in asthma programs targeted for their own ethnic group was beneficial in most asthma outcomes but not for asthma exacerbations. Thus there is insufficient data to be absolutely confident that the involvement of IHW is beneficial in all settings where asthma programs are delivered to Indigenous people (i.e. the vast heterogeneity in Indigenous cultures and health services provided to Indigenous people worldwide). Nevertheless, given the complexity of health outcomes and culture as well as the importance of self-determination for Indigenous peoples, the practice of including IHW in asthma education programs for Indigenous children and adults with asthma is justified, unless new data suggest otherwise.

Implications for research

Additional randomised controlled trials of IHW involvement in asthma education programs are clearly needed. Trials should be parallel studies and assessor blinded if possible. Outcome measures for asthma should include asthma exacerbation indices, patient-relevant factors (asthma control or quality of life or both) supported by objective data if possible. Inclusion of the cost effectiveness of the intervention would also be useful.

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* Indicates the major publication for the study

CHARACTERISTICS OF STUDIES

Characteristics of included studies [ordered by study ID]

Valery 2010

Methods	<p>Parellel randomised controlled trial carried out in a remote Indigenous region (Torres Straits and Northern Peninsular Area, Queensland, Australia). Eligible children were randomly allocated to one of the two treatment regimes: (1) additional asthma education intervention with children and their parents; (2) no additional education (children received the usual information about asthma at the consultation). Culturally appropriate paediatric asthma education materials were used during education sessions with parents and children; trained IHWs carried out the asthma education session</p> <p>Information was collected through face-to-face interviews using standardized data collection forms. Outcomes collected at baseline and at 12 months (last visit) when all children had another clinical consultation and outcome measures re-collected</p>
Participants	<p>113 of 117 (97%) eligible children (1-17 years) were enrolled. 88 (81%, 35 in 'IHW additional education' arm, 53 controls) with complete follow up were included in analysis</p> <p>Intervention arm: mean age 7.5, SD 4.4; 26 boys, 9 girls Control arm: mean age 6.6, SD 3.8; 35 boys, 18 girls.</p> <p>Baseline group similar in parental education, smoke exposure, baseline knowledge of asthma, QOL, FEV1. However the intervention group had a non-significant higher degree of asthma severity</p>
Interventions	<p>During the baseline visit all children received education about their asthma and the respiratory specialists, as well as the health workers, were involved in the consultation. They were shown how to use the Asthma Action Plan, and were given the asthma education booklets specifically prepared for the Torres Strait Islander children. Children selected to receive the intervention (additional asthma education) also received a personalised, child-friendly booklet (age specific booklets for 3-6 year olds, 7-10 year olds and over 10 year-olds) that were used during the consultation. The booklet contained personalised child data such as spirometry, Asthma Action Plan, and growth chart. In addition, children in the intervention group had three visits from the health worker for their asthma (about 1 month, 3 months and 6 months after the clinical consultation). During these visits, health workers used the same resources to reinforce asthma education and wrote the details down in the personalised child booklet. In each visit, the IHW also collected information on secondary outcome measures (i.e. quality of life questions) using a standardised data collection form. Adherence to protocol by the IHW was monitored by checking these forms</p> <p>The control group (no additional education) did not receive a personalised child-friendly booklet and were not visited by the health worker</p> <p>All children (i.e. both arms) received routine education in the clinic structure</p>
Outcomes	<p>Primary outcome was the number of unscheduled hospital/doctor visits due to asthma exacerbation. Secondary outcomes included: functional severity score, assessment of basic knowledge of medications and the delivery technique (if on regular medication), measurement of quality of life, Asthma Action Plan (readily available, can parent interpret?) and number of school days missed due to asthma</p>

Notes	3 authors of this review participated in this study	
<i>Risk of bias</i>		
Bias	Authors' judgement	Support for judgement
Random sequence generation (selection bias)	Low risk	Computer generated sequence but siblings were cohorted
Allocation concealment (selection bias)	Low risk	Obscured by opaque black sticker and sequentially assigned
Blinding (performance bias and detection bias) Exacerbations	Low risk	Single blind
Blinding (performance bias and detection bias) Asthma knowledge and skills	High risk	Unblinded
Blinding (performance bias and detection bias) Quality of life	High risk	Unblinded
Blinding (performance bias and detection bias) Days missed school	High risk	Decision to not send their child to school is a parental decision hence unblinded
Incomplete outcome data (attrition bias) All outcomes	Unclear risk	All follow-up reported but relatively high attrition
Selective reporting (reporting bias)	Low risk	Protocol available and outcomes determined a-priori on registered trial
Other bias	Unclear risk	Unequal numbers in groups, authors of review are also investigators of study

ED: Emergency Department; FEV1: Forced expiratory volume in one second; IHW: Indigenous healthcare worker; MFA GT/MFAT: Multifamily asthma group treatment; QOL: Quality of life; SD: Standard deviation; SPAI: Standard Psycho-educational Asthma Intervention

Characteristics of excluded studies *[ordered by study ID]*

Study	Reason for exclusion
Anderson 2004	Case control study (non randomised). Study on minority children with persistent asthma. The school program improved asthma control and reduced disease severity in the intervention group compared to controls
Beasley 1993	Non randomised study. Cohort study utilising a programme of Maori-based asthma clinics, and the partnership between the researchers and the Maori community groups
Black 2010	Groups were not randomised
Blixen 2001	RCT on culturally appropriate in-patient asthma education program for African-Americans. Intervention was by a trained nurse educator and it is uncertain if the program specifically included an Indigenous person. Corresponding author contacted via email (26th Feb 2007) with no response. Hence the study was excluded
Bruzzese 2008	RCT on a school-based intervention for adolescents with asthma and their caregivers. While staff were trained to be culturally sensitive and investigators tried as much as possible to match to ethnic group, indigeneity was not the main factor used (correspondence from principal investigator)
Butz	RCT on nurse lead program for minority families. No Indigenous health worker involvement in the study (correspondence from principal investigator)
Byrant 2008	RCT examining the efficacy of a low-cost approach to improve control of asthma symptoms in an urban population through lay educators who promote a generalized approach to asthma trigger avoidance in the bedrooms of children with asthma. Local ethnic-specific asthma educator was used. However the main protocol difference between observation and intervention groups was additional interventions for asthma triggers and allergy control, and not based on involvement of health worker. (correspondence from principal investigator)
D'Souza 1994	Non randomised study. Same study as Beasley 1993. Study reported improved asthma outcomes
D'Souza 1998	Non randomised study. Follow-up study on Beasley 1993; 2 yrs after completing the 6 month asthma programme, improved asthma outcomes reported
Evans 1997	22 clinics with predominantly ($\geq 67\%$) African-American or Latino children were randomised to intervention or control. Intervention was (a) education session for all staff, (b) tutorial session for physicians and (c) monthly visit by nurse educator. It is uncertain (although unlikely) if the program specifically included an Indigenous person. Corresponding author contacted via email (26th Feb 2007) with no response. Hence the study was excluded
Fifield 2010	Study using computer design support. Did not involve Indigenous support
Fisher 2009	Subjects were African-American children with asthma and the intervention involved CHW 'asthma coaches' who were African-American women. Study excluded as children were not Indigenous (to USA)
Flores 2009	RCT on the effects of parent mentors (PMs) on asthma outcomes in minority children. Study excluded as children were not Indigenous (to USA)

(Continued)

Griffiths 2005	Study of a lay-led self-management programme for Bangladeshi patients living in England. Not an Indigenous group
Kelso 1995	Non randomised study. Retrospective controls used. Letter written to corresponding author (Kelso) for further information was returned
Krieger 2009	RCT comparing 'in-home community health workers (CHW)' to routine. The CHW shared the same ethnic backgrounds as the families, who were white, African American, Vietnamese, other Asian, Hispanic. Study excluded as children were not Indigenous (to USA)
La Roche 2006	Randomised single blind, parallel comparison of 2 types of interventions: Multifamily asthma group treatment (MFAGT = IHW involvement) vs Standard Psycho-educational Asthma Intervention (SPAI = no IHW involvement) in children with asthma. These two interventions were also compared to controls (no additional education) that were randomly selected from pool of patients with asthma. Potential participants invited to participate in MFAT or SPAI. Patients completed 2 assessments (see outcome measures); one at enrolment and the 2nd was one year following intervention Randomisation and allocation method not described. Children were not indigenous to country of study. This study was previously included in original review but now excluded given definition of Indigenous criteria
Moudgil 2000	Non indigenous groups. Study based in England evaluating impact of asthma education on white Europeans and Indian sub-continent ethnic groups
Ratima 1999	Non randomised study.
Shackelford 2009	Study examined 'usual' education vs individualised education in adults with asthma. No specific Indigenous health worker involved. Only one adult per group was Indigenous

RCT: randomised controlled trial

Characteristics of studies awaiting assessment *[ordered by study ID]*

Bruze 2010

Methods	await further details
Participants	
Interventions	
Outcomes	
Notes	

DATA AND ANALYSES

Comparison 1. Exacerbations

Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Mean number of acute medical visits during the year after intervention	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
2 Number of children hospitalised for asthma during study period	1		Odds Ratio (M-H, Fixed, 95% CI)	Totals not selected

Comparison 2. Asthma Questionnaires

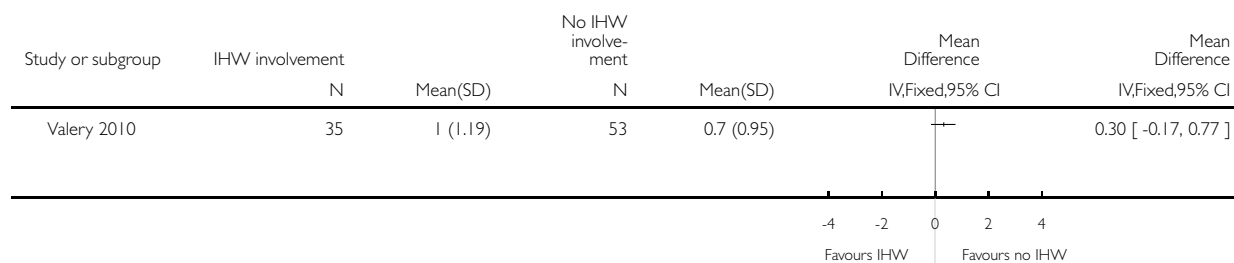
Outcome or subgroup title	No. of studies	No. of participants	Statistical method	Effect size
1 Mean asthma knowledge score post intervention	1		Mean Difference (IV, Random, 95% CI)	Totals not selected
1.1 Parents' score	1		Mean Difference (IV, Random, 95% CI)	0.0 [0.0, 0.0]
2 Mean asthma skill score post intervention	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
2.1 Parents' score	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]
3 Quality of Life (QoL)	1		Mean Difference (IV, Fixed, 95% CI)	Totals not selected
3.1 Parents' QoL	1		Mean Difference (IV, Fixed, 95% CI)	0.0 [0.0, 0.0]

Analysis 1.1. Comparison 1 Exacerbations, Outcome 1 Mean number of acute medical visits during the year after intervention.

Review: Indigenous healthcare worker involvement for Indigenous adults and children with asthma

Comparison: 1 Exacerbations

Outcome: 1 Mean number of acute medical visits during the year after intervention

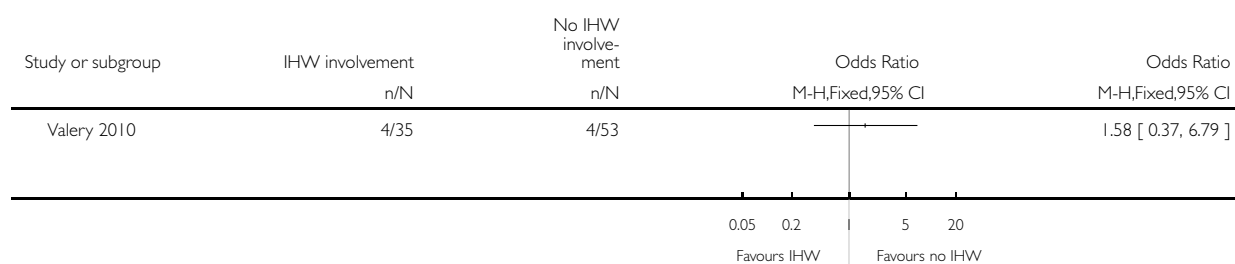


Analysis 1.2. Comparison 1 Exacerbations, Outcome 2 Number of children hospitalised for asthma during study period.

Review: Indigenous healthcare worker involvement for Indigenous adults and children with asthma

Comparison: 1 Exacerbations

Outcome: 2 Number of children hospitalised for asthma during study period

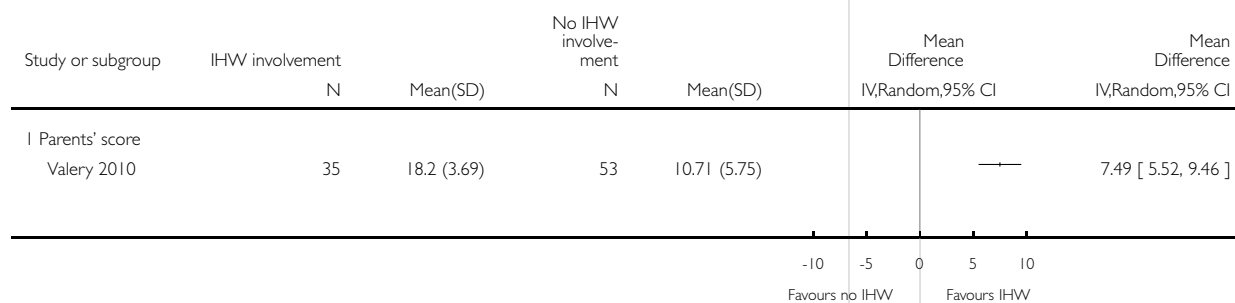


Analysis 2.1. Comparison 2 Asthma Questionnaires, Outcome 1 Mean asthma knowledge score post intervention.

Review: Indigenous healthcare worker involvement for Indigenous adults and children with asthma

Comparison: 2 Asthma Questionnaires

Outcome: 1 Mean asthma knowledge score post intervention

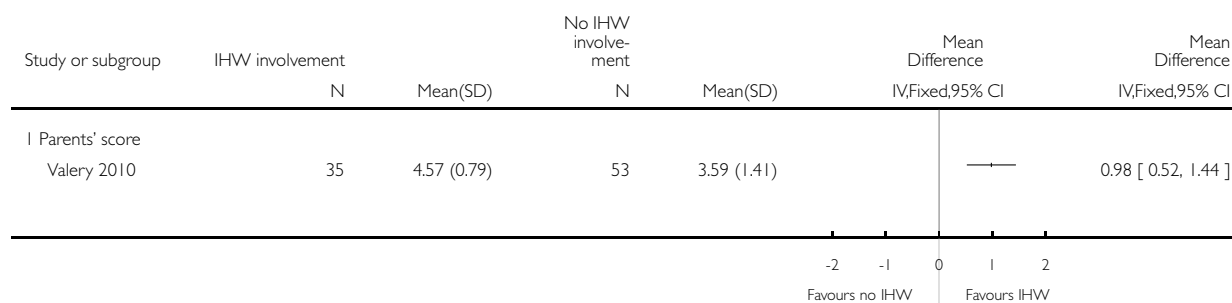


Analysis 2.2. Comparison 2 Asthma Questionnaires, Outcome 2 Mean asthma skill score post intervention.

Review: Indigenous healthcare worker involvement for Indigenous adults and children with asthma

Comparison: 2 Asthma Questionnaires

Outcome: 2 Mean asthma skill score post intervention

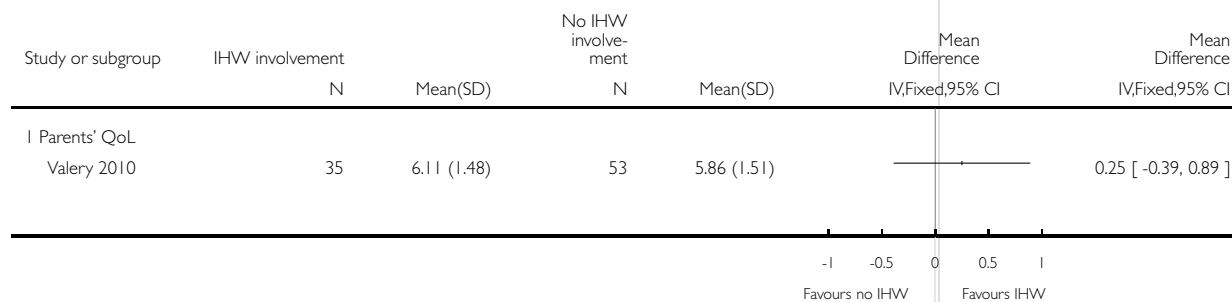


Analysis 2.3. Comparison 2 Asthma Questionnaires, Outcome 3 Quality of Life (QoL).

Review: Indigenous healthcare worker involvement for Indigenous adults and children with asthma

Comparison: 2 Asthma Questionnaires

Outcome: 3 Quality of Life (QoL)



APPENDICES

Appendix I. Search strategies

CENTRAL

- #1 MeSH descriptor Asthma explode all trees
- #2 MeSH descriptor Bronchial Spasm explode all trees
- #3 asthma*
- #4 wheez*
- #5 bronchospas*
- #6 bronch* near spas*
- #7 bronchoconstrict*
- #8 bronch* near constrict*
- #9 (#1 OR #2 OR #3 OR #4 OR #5 OR #6 OR #7 OR #8)
- #10 MeSH descriptor Oceanic Ancestry Group, this term only
- #11 (aboriginal* or aborigine*)
- #12 indigenous
- #13 MeSH descriptor Minority Groups, this term only
- #14 (#10 OR #11 OR #12 OR #13)
- #15 MeSH descriptor Self Care, this term only
- #16 MeSH descriptor Self Administration, this term only
- #17 MeSH descriptor Self Medication, this term only
- #18 MeSH descriptor Self Efficacy, this term only
- #19 self manage*
- #20 MeSH descriptor Patient Acceptance of Health Care explode all trees
- #21 MeSH descriptor Patient Education explode all trees
- #22 MeSH descriptor Patient Care Planning explode all trees
- #23 MeSH descriptor Patient-Centered Care explode all trees
- #24 MeSH descriptor Health Services, Indigenous, this term only
- #25 indigenous health*
- #26 aboriginal* health*
- #27 (#15 OR #16 OR #17 OR #18 OR #19 OR #20 OR #21 OR #22 OR #23 OR #24 OR #25 OR #26)
- #28 (#9 AND #14 AND #27)

MEDLINE

- 1 exp asthma/
- 2 exp Bronchial Spasm/
- 3 asthma\$.mp.
- 4 wheez\$.mp.
- 5 bronchospas\$.mp.
- 6 (bronch\$ adj3 spas\$.mp.
- 7 bronchoconstrict\$.mp.
- 8 (bronch\$ adj3 constrict\$.mp.
- 9 or/1-8
- 10 oceanic ancestry group/
- 11 (aboriginal\$ or aborigine\$.mp.
- 12 indigenous.mp.13 minority groups/
- 14 or/10-13
- 15 self care/ or self administration/ or self medication/ or self efficacy/ or self manage\$.mp.
- 16 "patient acceptance of health care"/ or patient compliance/ or patient participation/ or patient satisfaction/ or treatment refusal/
- 17 patient education/ or patient care planning/ or patient-centered care/

18 health services indigenous/ or indigenous health\$.mp. or aboriginal\$ health\$.mp. or aborigine\$ health\$.mp.

19 or/15-18

20 9 and 14 and 19

(Combined with RCT filter as described in the Airways Group [editorial information](#))

EMBASE

1 exp asthma/

2 Bronchospasm/

3 asthma\$.mp.

4 wheez\$.mp.

5 bronchospas\$.mp.

6 (bronch\$ adj3 spas\$).mp.

7 bronchoconstrict\$.mp.

8 (bronch\$ adj3 constrict\$).mp.

9 or/1-8

10 aborigine/ or indigenous people/

11 (aboriginal\$ or aborigine\$).mp.

12 indigenous.mp.

13 exp minority group/

14 or/10-13

15 self care/ or self care agency/ or self help/ or self medication/ or drug self administration/ or self efficacy/ or self manage\$.mp.

16 patient attitude/ or patient compliance/ or patient participation/ or patient satisfaction/ or refusal to participate/ or treatment refusal/

17 health education/ or health promotion/ or nutrition education/ or patient education/

18 exp patient care/ or health care planning/ or patient care planning/

19 health services indigenous/ or indigenous health\$.mp. or aboriginal\$ health\$.mp. or aborigine\$ health\$.mp.

20 or/15-19

21 9 and 14 and 20

(Combined with RCT filter as described in the Airways Group [editorial information](#))

WHAT'S NEW

Last assessed as up-to-date: 19 January 2011.

Date	Event	Description
20 January 2011	New search has been performed	Literature search re-run and no new studies were identified. One study was removed from the analysis (La Roche 2006) as we decided it is more relevant to be included in our review on culture-specific interventions for children and adults from minority groups with asthma (Bailey 2009). Risk of bias tables updated. Other minor amendments made throughout document

HISTORY

Protocol first published: Issue 1, 2007

Review first published: Issue 4, 2007

Date	Event	Description
9 January 2010	New citation required and conclusions have changed	New study added and conclusions changed.
6 January 2010	New search has been performed	Literature search re-run
24 March 2009	Amended	Change of contact details
6 December 2008	New search has been performed	Literature search re-run: no new studies
28 July 2008	Amended	Converted to new review format.
14 August 2007	New citation required and conclusions have changed	Substantive amendment

CONTRIBUTIONS OF AUTHORS

Protocol: AC wrote the protocol, AB reviewed the protocol.

Review: AC and AB selected relevant papers from searches. AC extracted the data and performed data analysis. All contributed to writing or reading the review.

DECLARATIONS OF INTEREST

AC, IBM and YL were involved in one of the trials included in this review ([Valery 2010](#)).

SOURCES OF SUPPORT

Internal sources

- Royal Children's Hospital Foundation, Brisbane, Australia.

External sources

- National Health and Medical Research Council, Australia. Practitioner Fellowship for AC (grant number 525216)
- Queensland Smart State Clinical Fellowship, Australia. Support for AC

DIFFERENCES BETWEEN PROTOCOL AND REVIEW

We refined the inclusion criteria to exclude trials involving minority groups that were not indigenous to the country of the study. This resulted in the exclusion of a trial included in an earlier version of the review ([La Roche 2006](#)).

The risk of bias assessment was updated in 2010 and subsequent issues to reflect recommendations of the Cochrane Risk of bias tool which is described in chapter 8 of the Cochrane handbook ([Higgins 2008](#)).

INDEX TERMS

Medical Subject Headings (MeSH)

*Community Health Workers; *Health Services, Indigenous; *Minority Groups; African Continental Ancestry Group; Asthma [ethnology; *therapy]; Hispanic Americans; Oceanic Ancestry Group; Patient Education as Topic; Randomized Controlled Trials as Topic

MeSH check words

Adult; Child; Humans