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Cultural perspectives of interventions for managing diabetes and asthma in children and adolescents from ethnic minority groups

V. Mc Manus and E. Savage

Catherine McAuley School of Nursing and Midwifery, University College Cork, Cork, ..

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Abstract

Both diabetes and asthma are increasingly being recognized as health problems for ethnic groups. Because of cultural differences, ethnicity is reported to be a risk factor for poorer quality in health care, disease management and disease control. Ethnic groups are at risk for poorer quality of life and increased disease complications when compared with non-ethnic counterparts living in the same country. There is little known about how culture is addressed in interventions developed for ethnic groups. The aim of this paper is to systematically review the cultural perspectives of interventions for managing diabetes and asthma in children, adolescents and/or their families from ethnic minority groups.

A total of 92 records were identified that were potentially relevant to this review following which, 61 papers were excluded. The full texts of remaining papers ($n = 31$) were then read independently by both authors, and agreement was reached to exclude a further 27 papers that did not meet inclusion criteria. A total of four papers were eligible for inclusion in this review.

Findings indicate that despite growing concerns about health disparities between ethnic and non-ethnic groups in relation to both asthma and diabetes in childhood, there has been little effort to develop cultural specific interventions for ethnic groups.

By systematically reviewing asthma and diabetes interventions we have highlighted that few interventions have been developed from a cultural perspective. There are a limited number of interventions published that add knowledge on the specific elements of intervention that is needed to effectively and sensitively educate other cultures. More work is required into identifying which strategies or components of cultural interventions are most effective in achieving positive health outcomes for children, adolescents and/or their families from ethnic groups.

Keywords

adolescents, asthma, children, culture, diabetes mellitus, ethnic groups, intervention

- Correspondence: Vicki Mc Manus, Catherine McAuley School of Nursing and Midwifery, Brookfield Health Sciences Building, University College Cork, Cork, .., E-mail: v.mcmanus@ucc.ie

Introduction

Cultural diversity is a phenomenon encountered worldwide and a continuous pattern of inward migration of ethnic groups is now apparent in many developed countries. For example, a US Census report in 2004 noted that 25% of the population accounted for ethnic or other racial groups including Hispanic/Latinos, Africans and Asians: the Census projected a continuing rise in most ethnic groups (US Census Bureau 2004). Likewise in

Europe, a growing trend of migration is apparent. For example, in Ireland, there has been a notable growth in cultural diversity since the 1990s with 35% of inward migration originating from countries outside the European Union (EU). This figure had more than tripled since 1996 (Central Statistics Office 2003) and has continued to rise with migrants mostly coming from non-EU Eastern European countries (Central Statistics Office 2006).

Migration and the increasing population of ethnic minority groups in many countries are now recognized as major health

care challenges which are being debated at national and international levels. The challenges include communication and language barriers, health illiteracy, culturally inappropriate health information, limited cultural awareness and competence among health care professionals, and lack of access to health services (Campos 2006; Chin *et al.* 2007). In a Cochrane review of 31 studies on ethnic/racial groups of adolescents, Elster and colleagues (2003) concluded that disparities exist across a range of health care services for these groups, independent of socio-economic group. Ethnicity was reported to be a risk factor for poorer-quality health care, poorer disease management and control, poorer quality of life and increased disease complications compared with non-ethnic counterparts living in the same country (Elster *et al.* 2003)

In the case of childhood chronic illnesses, both diabetes and asthma are increasingly being recognized as a threat to the health of ethnic minority groups worldwide (Saxena *et al.* 2002; Carballo and Siem 2006; Canino *et al.* 2008). For example, there is evidence to suggest that the prevalence of childhood asthma is increasing among ethnic minority groups with rates of 26% reported for Hispanic children compared with 13% in non-Hispanic children living in the USA (Lara *et al.* 2006). Drawing on papers from the UK and USA, Milton and colleagues (2004) noted growing disparity in asthma prevalence between ethnic and non-ethnic groups and that this disparity is increasing between ethnic groups. Similarly, the findings of a US population-based study on over 6000 youths indicate that the prevalence of type 2 diabetes (DMT2) is greater in ethnic youths, most notably, Hispanics and 'blacks' compared with non-Hispanic whites. For these groups, prevalence rates of cases per 1000 youth were reported to be 1.74, 1.05 and 0.19, respectively (SEARCH for Diabetes in Youth Study Group 2006). While long considered a disease of adulthood, DMT2 is now a childhood disease which currently accounts for 20–50% of all new referrals in individuals under 18 years of age (Hale 2004; Haines 2007). For diabetes type 1 (DMT1), a greater prevalence has been found in non-Hispanic whites compared with ethnic minority groups (SEARCH for Diabetes in Youth Study Group 2006). However, ethnicity as a risk factor needs to be considered for those who have DMT1 in relation to disparities around access to services including support to manage complex treatment demands.

Both childhood diabetes and asthma involve complex management of treatment requirements on a daily basis. Diabetes involves insulin replacement (type 1), monitoring of blood sugars, adopting healthy eating habits, taking regular exercise and monitoring for complications (DeFronzo 2004). Asthma management involves taking regular medications (e.g. inhalers),

taking regular exercise, monitoring symptoms and taking environmental precautions against exposure to triggers that could exacerbate the condition (Lewis *et al.* 2004). Results from previous reviews have shown that interventions designed to help children, adolescents and their families to manage their diabetes or asthma have met with some success in terms of achieving positive health outcomes (e.g. Grey 2000; Guevara *et al.* 2003; Murphy *et al.* 2006). However, these findings have limited application to ethnic groups because studies have mostly sampled non-ethnic groups.

According to Caballero (2006), there is a need to tailor health services to the specific needs of culturally diverse populations, taking account their distinct behaviours, beliefs and languages. Evidence from systematic reviews of culturally tailored interventions suggests positive outcomes in adults with DMT2 (Whittemore 2007; Hawthorne *et al.* 2008) and with asthma (Bailey *et al.* 2008). Bailey *et al.*'s review which included two randomized controlled trials (RCTs) involving children (La Roche *et al.* 2006; Canino *et al.* 2008) concluded that culturally specific interventions targeting minority groups show more promising effectiveness than generic interventions. Apart from this review, there has been little attempt to date to systematically examine the effectiveness of interventions on health outcomes for children or adolescents from ethnic groups who have asthma or diabetes. Moreover, there has been little debate to date on the cultural perspectives of interventions, and we found no published reviews that systematically examined the cultural components of interventions designed to address the cultural needs of ethnic groups.

The aim of this paper is to systematically review the cultural perspectives of interventions for managing diabetes and asthma in children, adolescents and/or their families from ethnic minority groups. The objectives are: (i) to identify which ethnic groups have been targeted in intervention studies; (ii) to determine which interventions have been implemented with ethnic groups; (iii) to examine the cultural perspectives of interventions; and (iv) to report on outcomes measured and the effectiveness of interventions on these outcomes.

Methods

For this review, we adopted the principles of conducting systematic reviews described by the Centre for Review and Dissemination (2008).

Search strategies

Inclusion and exclusion criteria were specified prior to commencing the search strategy. Inclusion criteria were primary

1 studies of interventions developed from a cultural perspective
 2 which focused on managing asthma or diabetes (types 1 or 2) in
 3 study participants that were explicitly stated as being from
 4 ethnic minority groups; studies that sampled children and/or
 5 adolescents up to the end of 18 years; studies that sampled
 6 single or multiple ethnic groups; studies that sampled ethnic
 7 and non-ethnic groups provided that data specific to ethnic
 8 groups could be extracted; studies that sampled a cross-section
 9 of population including adults provided that data specific to
 10 children and adolescents could be extracted; studies that met
 11 one or more of the review objectives; studies published in the
 12 English language. Exclusion criteria were studies on interven-
 13 tions with ethnic minority groups that were generic rather than
 14 designed from a cultural perspective; studies with adults aged
 15 over 18 years and studies not published in the English language.
 16 For this review, ethnic minority groups were defined as resi-
 17 dents in a country who originated from other countries. Groups
 18 that were identified as a group or community, through a
 19 common heritage, a distinctiveness recognized through
 20 common cultural, linguistic, religious traits as indicators of
 21 contrast to the majority or dominant population of their

country of residence. This definition is consistent with that used
 by other reviewers who have examined cultural specific pro-
 grammes for ethnic minority groups (Hawthorne *et al.* 2008)

Electronic searches were used to identify relevant papers.
 Searches were restricted to papers published between 1 January
 2000 and 1 May 2009. Databases searched for potentially eligible
 studies included: Medline, Embase, Pubmed, Cinahl, Psychol-
 ogy and Behavioural Sciences Collection. Manual searches
 were performed by checking reference lists in selected papers.
 Search terms, mostly MESH subject descriptors, were used in
 various combinations: diabetes mellitus type 1/diabetes melli-
 tus type 2/asthma; ethnic groups/minority groups/migrants/
 immigrants; intervention/randomized controlled trial/clinical
 trial; patient, patient education/disease management/self care/
 self management/family management; and cultural/ culture
 were combined with terms specific to population group, that is
 child/adolescent/paediatric. All papers gleaned were reviewed,
 analysed and appraised by both authors.

As illustrated in Fig. 1, a total of 92 papers were identified that
 seemed potentially relevant to this review. The title and abstract
 of each paper were initially scanned by both authors following

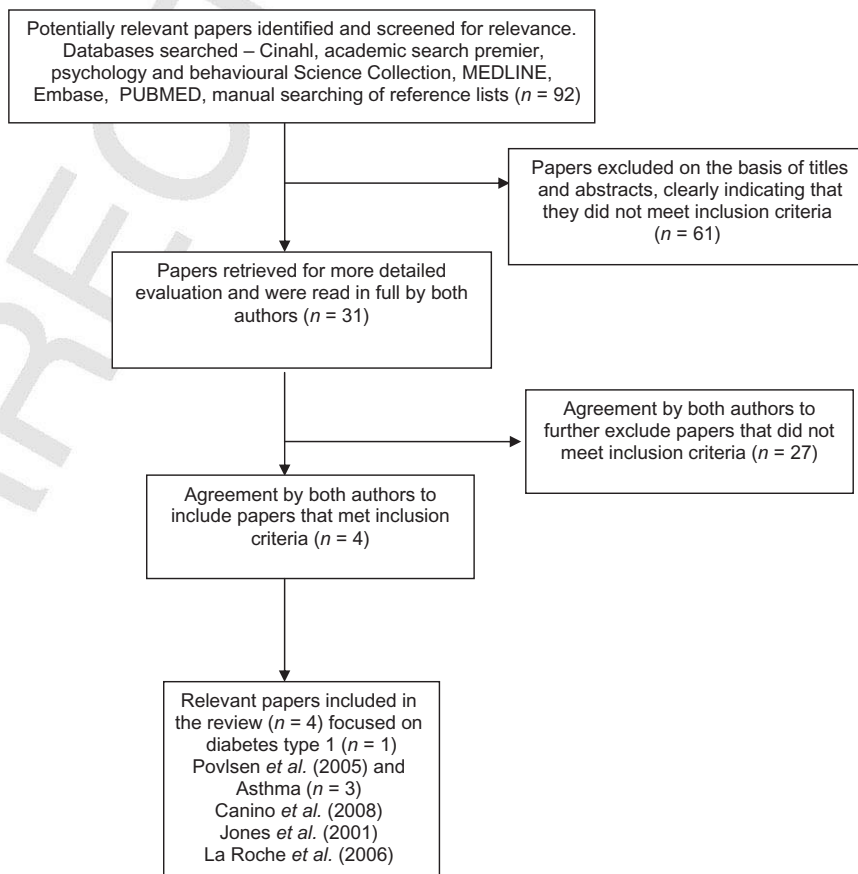


Figure 1. Flowchart for main search.

which 61 papers were excluded (Fig. 1). The full texts of remaining papers ($n = 31$) were then read independently by both authors, and agreement was reached to exclude a further 27 papers that did not meet inclusion criteria. Papers were excluded either because they did not implement any intervention or an intervention with a cultural component, or because they did not include an ethnic group. A total of four papers were eligible for inclusion in this review.

Data extraction

Data extracted from each paper included: authors and year of publication, disease, country of origin, aim(s) of study, sampling details including ethnic groups and age groups, description of intervention including details of cultural basis if reported, and outcomes (Table 1). Data were extracted by VMcM and cross-checked by E. S. followed by discussion between both authors to reach consensus on content and detail of data extracted.

Data synthesis

A narrative approach to data synthesis was used. Because research designs differed across studies including RCTs and quasi-experimental trials, statistical procedures using meta-analysis were not conducted.

Quality appraisal of studies

The quality of studies was assessed using criteria from the CONSORT guidelines on the reporting of RCTs (Boutron *et al.* 2008), although criteria for randomization did not apply to non-RCTs. Assessment criteria applied to both RCTs and non-RCTs were: power calculation of sample size; blinding; and the use of reliable and valid measures for all outcomes and the validity and reliability scores for each reported. For RCTs, quality of randomization was assessed on sequence generation, allocation concealment and implementation of randomized methods (who generated allocation sequence, who enrolled subjects and who assigned participants to interventions or control groups). Quality was recorded as 'adequate' or 'unclear' if reference to a criterion was made but little clarity provided. When no details for specific criteria were provided, we recorded 'not reported'. Quality appraisal was conducted by E. S. and cross-checked by VMcM, followed by discussion and consensus.

Results

A summary of results on the four studies reviewed are presented in Table 1 according to objectives set, therefore addressing

ethnic groups targeted in studies, types of interventions, cultural perspectives of interventions and the effectiveness of interventions on health care outcomes. Of the four papers reviewed, three addressed asthma (Jones *et al.* 2001; La Roche *et al.* 2006; Canino *et al.* 2008) and one addressed type 1 diabetes (Povlsen *et al.* 2005). No papers were found on DMT2. We included two papers (La Roche *et al.* 2006; Canino *et al.* 2008) previously reviewed in a Cochrane review (Bailey *et al.* 2008) because in addition to examining intervention effectiveness, we were interested in reviewing the cultural components of interventions.

Ethnic minority groups and their characteristics

Three studies were conducted in the USA (including Puerto Rico) and one in Europe (Denmark). The ethnic minority group studied across US studies were of Hispanic/Latino, African American or Puerto Rican origin. The Danish study sampled immigrant and refugee families from countries outside Western Europe, North America or Australia. In one study children's participation with parents was encouraged but not required (Jones *et al.* 2001). Both children and their parents were sampled in two studies (Povlsen *et al.* 2005; La Roche *et al.* 2006). In Canino and colleagues' (2008) family intervention, it was unclear if children were participants as well as 'caregivers'. The age range of children and adolescents targeted across studies was 3–17 years. Broad developmental age bands were sampled in all studies: early childhood to late adolescents (Jones *et al.* 2001), middle childhood to early adolescents (La Roche *et al.* 2006; Canino *et al.* 2008) and middle childhood to late adolescents (Povlsen *et al.* 2005). Sample sizes across studies varied from 24 and 37 families in two studies (Povlsen *et al.* 2005; La Roche *et al.* 2006) to between 204 and 210 in two studies (Jones *et al.* 2001; Canino *et al.* 2008). A total sample size of 494 was sampled across studies. Samples were identified from a variety of locations (Table 1). The total sample size for individual ethnic groups could not be gleaned however because subgroup sample sizes were not reported in studies that included more than one ethnic group.

Types of interventions

The type of intervention implemented across all studies was educational focusing on the family. Of these, two were RCTs (La Roche *et al.* 2006; Canino *et al.* 2008). A pre-post test design was used in two studies (Jones *et al.* 2001; Povlsen *et al.* 2005) with one of these also incorporating elements of action research (Povlsen *et al.* 2005). Educational interventions typically focused on knowledge and skills acquisition around diabetes or

Table 1. Details of included studies

Authors	Date	Country	Illness	Aims & objectives	Sample	Design	Intervention & description of cultural perspectives	Outcomes
Povlsen <i>et al.</i> (2005)	Denmark	DMT1	To evaluate the effectiveness of an educational programme in optimizing metabolic control in children and knowledge levels about diabetes	37 ethnic minority families of children and adolescents aged 10–17 years Families were of immigrant and refugee background from countries outside Western Europe, North America & Australia Seven different ethnic groups (groups not explicit other than stating inclusion of 'Muslims' and languages spoken across groups – Turkish, Arabic, Somali, Urdu) Sample taken from the paediatric department in the hospital families attended	Prospective (including pre-test) with principles of action research applied involving further development of material and educational process	Re-education of children, adolescents and parents using adapted (colour & decorated to Muslim traditions) and translated educational material and guidelines on topics relevant to DMT1; material translated by interpreters Health care professionals received (i) information on ethnic minorities and possible barriers to health care in Denmark, (ii) guidelines for application of educational material and sessions Re-education, mostly in groups of ethnic similarity over a period of 11 months; parents had eight sessions (assisted by professional interpreters experienced in DMT1); children and adolescents had seven sessions with some participants requiring Danish version because of difficulties mastering native language of parents	Outcomes were measured before, and 0, 3 & 6 months after educational sessions Knowledge of DMT1: increase reported for 95% children and all parents which was attributed to education material provided and use of interpreters for parents Metabolic control: HbA _{1c} decreased from 9.2% to 8.6% (pairwise <i>t</i> -test: <i>P</i> = 0.01) but increased after 3-month (8.9%) and 6-month (9.1%) follow-up. Total number of severe hypoglycaemic attacks increased from 3 to 10 but not statistically significant	
Canino <i>et al.</i> (2008)	Asthma		To investigate the effectiveness of a family intervention for asthma management in reducing asthma morbidity in 'poor' Puerto Rican children	210 'poor' Puerto Rican children aged 5–12 years with persistent asthma Families included but members not stated other than 'caregivers' who were defined as the adults legally responsible for the child Sample identified from a government poverty agency Selected based on hospitalizations, emergency visits and ambulatory visits due to asthma	Randomized controlled clinical trial	Education intervention comprised of eight modules focusing on knowledge about asthma and on empowering families to take control and achieve management of asthma Of the 210 families, 110 were randomized into the intervention group and 111 into control group Intervention delivered by trained asthma counsellor over two home visits (approx. 18 days apart) with follow-up telephone contact to provide ongoing of recommended action plans and home assignments; families had a manual of material taught in the eight modules Intervention was culturally adapted to reflect common myths and practices among Puerto Rican parents about asthma; culturally congruent pictures were included; asthma triggers common for Puerto Rico were included Cultural adaptation of intervention was through research using a collaborative participatory approach involving several community partners such as health educators and mothers of children with asthma Control group received educational material in five flyers covering general topics about asthma, its prevention and treatment	Outcomes measured 4 months after intervention Asthma morbidity: no difference between intervention and control groups for symptom free days, medication use, or activity limitation. However, intervention group had significantly more symptom free nights and were three times more likely to have asthma under control intervention group. Over a third (37%) were less likely to visit Emergency Department, and over two-thirds (68%) were less likely to be hospitalized Caregiver quality of life: intervention group (compared with control group) reported better quality of life, and being significantly less likely to feel helpless, upset or frustrated because of their child's asthma Asthma knowledge: intervention group were significantly more likely to report increased asthma knowledge, and were more likely to feel confident about managing their child's asthma Empowerment: no difference between groups in empowering caregiver's to manage the health care system	

Table 1. Continued

Authors	Date	Country	Illness	Aims & objectives	Sample	Design	Intervention & description of cultural perspectives	Outcomes
Jones <i>et al.</i> (2001)			Asthma	To devise and assess a culturally tailored asthma educational programme for underserved Latino families	204 Latino children and their families (of Latino or Hispanic parents) aged 3–17 years residing in the San Diego area who had previously taken part in a larger clinical trial	A quantitative pre/post test design	An asthma education intervention was devised for families of asthmatic children. Educational sessions delivered in family homes, were scheduled approximately 1 week following pre-test measures; average duration of programme was 108 min delivered in one or two sessions; asthmatic child's participation was encouraged but not required. Of the 204 families recruited, 193 were in the final intervention group. The intervention, adapted from one previously used for a low literacy population, was delivered using a didactic pedagogy, providing standardized information of asthma topics. The culturally tailored elements of the intervention included Latino acculturation training of the trainers to facilitate families in the following areas: improving communication and assertiveness with medical providers (as a partner in planning care), providing recommendations without refuting family health beliefs, addressing father's lack of involvement in child's health, improving translation of terminology and the fact that all questions were translated from English to Spanish as required using phrases specific to this ethnic population. Languages included English & Spanish.	Outcomes were measured approximately 1 week after educational sessions. Asthma knowledge: increased by 30% (SD 0.75) with the mean percentage correct on asthma knowledge quiz increasing to 50.1% (SD 17.1) at post-test compared with 38.7% (SD 15.7) correct at pre-test. ($P < 0.001$). Home management procedures: (i) number of asthma triggers in child's environment decreased by 25% from a mean 2.5 pre-test to 1.8 post-test ($P < 0.001$); (ii) increase in asthma controllers in child's bedroom by 29% from a mean of 0.7 pre-test to 0.9 post-test ($P < 0.001$)
La Roche <i>et al.</i> (2006)			Asthma	To examine the effectiveness of the Multifamily Asthma Group treatment (MFAGT) aimed at enhancing asthma management and reducing visits to the emergency department	24 families African American and Hispanic Families with children aged 7–13 years (11 in the control group) referred by primary care physician and then randomly assigned to either group	Randomized controlled clinical trial	A family education intervention, the Multifamily Asthma Group Treatment intervention (MFAGT), delivered in three 1-h modules, on different days, focusing on asthma knowledge, asthma skills including behavioural utilization where parents and children, from different families, were encouraged to use their own cultural background as a means of managing asthma using the MFAGT intervention. A goal of MFAGT was to improve symptom management designed to be consistent with 'allocentric self orientation' and the socio-economic context of ethnic minorities. Of the 33 families that participated, 12 were randomized into the intervention group (MFAGT), 12 into a Standardized Psycho-educational Asthma Intervention (SPA) which was not located in cultural context; and 11 into a control group who did not participate in any educational intervention (two families were not included in final analysis). The cultural context of the MFAGT intervention included: delivery in small groups of parents and children from different families, which acknowledged that collaboration with other ethnic families was key to managing asthma; different members of the group encouraged to share their beliefs and concerns about asthma; family members encouraged to draw on their own sociocultural resources as a basis for managing asthma.	Outcomes and differences between groups were compared before intervening and 1 year after the intervention. Emergency department (ED) visits: the MFAGT significantly reduced the mean number (0.7) of visits to ED (71% reduction in 1 year post intervention, $P = 0.04$) compared with mean number of visits for SPA (1.2) and control group (1.4); the intervention was reported as 50% more successful in reducing ED visits than SPA and twice as effective as no intervention at all. Asthma management: scores significantly increased following interventions for MFAGT and SPA groups, and not for control group. Although a number of subscale scores improved more in MFAGT group compared with SPA group, improvement in only one subscale (parent asthma knowledge) was significant ($t = -3.0$, $P = 0.009$). No differences were found between Hispanics and African Americans.

DMT1, diabetes type 1.

27 28 Table 2. ..

Criteria – clear statement & evidence of:	Povlsen <i>et al.</i> (2005)	Canino <i>et al.</i> (2008)	Jones <i>et al.</i> (2001)	La Roche <i>et al.</i> (2006)
Sample size power calculation done to determine size & adequately powered	Not reported	Not reported	Not reported	Not reported
Randomization				
(a) sequence generation	NA	Adequate*	Not reported	Not reported
(b) adequate allocation concealment	NA	Not reported	Unclear	Not reported
(c) Implementation re (i) who generated allocation sequence; (ii) who enrolled subjects; (iii) who assigned participants to groups	NA	Not reported	Not reported	Not reported
Blinding (masking)	Not reported	Not reported	Unclear	Not reported
Measurements				
Reliable & valid scores	Not reported	Adequate	Not reported	Adequate

NA = Not applicable.

*Noted to be part of a larger clinical trial for which details on sequence generation were provided.

asthma care. The number of educational contact sessions received by families varied: Jones and colleagues (2001) delivered one or two sessions; La Roche and colleagues (2006) delivered three 1-h sessions; Canino and colleagues (2008) delivered two sessions and Povlsen and colleagues (2005) delivered eight sessions (see Table 1).

Cultural perspectives of interventions

The interventions in all four studies were designed for implementation with ethnic minority groups. As shown in Table 1, the cultural perspectives of interventions varied across studies including the adaptation and translation of existing educational materials to cultural traditions (Povlsen *et al.* 2005), and working with the cultural beliefs, myths and practices of ethnic groups (Jones *et al.* 2001; La Roche *et al.* 2006; Canino *et al.* 2008). Delivery of interventions in the relevant languages of ethnic groups was reported in three studies (Jones *et al.* 2001; Povlsen *et al.* 2005; La Roche *et al.* 2006), two of which specifically reported on translations being facilitated by professional interpreters (Jones *et al.* 2001; Povlsen *et al.* 2005). In Jones *et al.*'s study, the interventionists were trained in Latino culture. One group of researchers described adopting a collaborative approach with ethnic groups in the community towards developing a cultural intervention (Canino *et al.* 2008). The terminology used to address culture varied between interventions with reference to 'culturally competent' (La Roche *et al.* 2006), 'culturally tailored' (Jones *et al.* 2001) and 'culturally adapted' (Povlsen *et al.* 2005; Canino *et al.* 2008),

Health care outcomes measured

As shown in Table 1, all interventions were found to have positive effects on some outcomes measured. Knowledge and physiologi-

cal disease status were the two most commonly measured outcomes across studies. Knowledge was found to have improved following three interventions; La Roche and colleagues (2006) did not measure knowledge. Physiological disease status was evaluated in three studies with improvements noted for night time asthma symptom control (Canino *et al.* 2008), reduction in emergency visits for asthma treatment (La Roche *et al.* 2006; Canino *et al.* 2008) and initial improvement in glycaemic control (HbA1c level) for diabetes but that was not sustained at 6 months following intervention (Povlsen *et al.* 2005). Psychosocial variables were measured in one study only which were caregiver quality of life and family empowerment (Canino *et al.* 2008). In this study, a culturally tailored intervention for asthma management was found to improve quality of life.

Discussion

In this paper, we set out to systematically review cultural perspectives of interventions for ethnic minority children, adolescents and/or their families in the management of diabetes type 1 or 2 or the management of asthma. The findings indicate that despite growing concerns about health disparities between ethnic and non-ethnic groups in relation to childhood asthma (Milton *et al.* 2004) and diabetes (Carballo and Siem 2006), there has been little effort to develop cultural interventions for ethnic groups. Inroads towards the development of cultural interventions were more evident for asthma than for diabetes, with only one study found on type 1 diabetes, and none found on DMT2. Our search for papers for this review showed that while many studies of interventions for asthma (Bonner *et al.* 2002; Bruzzese *et al.* 2008) or diabetes include ethnic groups (Two feathers *et al.* 2005), interventions were not developed to address the cultural perspectives of ethnic groups. The evidence from this review supports the need for cultural interventions

1 because positive effects were found for most outcomes across all
 2 four studies compared with control groups in two RCTs (La
 3 Roche *et al.* 2006; Canino *et al.* 2008) and to pre-post test scores
 4 in two quasi-experimental designs (Jones *et al.* 2001; Povlsen
 5 *et al.* 2005). This evidence is consistent with previous reviews
 6 focusing on children and adults with asthma (Bailey *et al.* 2008),
 7 and adults with DMT2 (Whittemore 2007).

8 This review identified that the perspectives adopted in the
 9 delivery of cultural interventions for ethnic groups fell into four
 10 categories: (1) translation into native language of ethnic groups;
 11 (2) accommodation of beliefs, myths and practices of ethnic
 12 groups; (3) acculturation of interventionists; and (4) adopting a
 13 collaborative approach to intervention development with
 14 ethnic groups. Delivering an intervention in the native language
 15 of ethnic groups is an important cultural strategy because lan-
 16 guage is considered to be an obvious barrier in the provision of
 17 health care to ethnic groups (Caballero 2006). According to
 18 Whittemore (2007), the availability of health services in the
 19 language of those receiving care marks the beginning of 'culturally
 20 competent health care'.

21 Although language is important as a cultural strategy for
 22 communicating health information to ethnic groups, it needs to
 23 be complemented with strategies for promoting health literacy.
 24 Health literacy concerns an individual's capacity to understand
 25 and process health information necessary to function in the
 26 health care environment (Caballero 2006) and is dependent on
 27 an individual's reading and numerical skills including the
 28 capacity to accurately interpret the meaning of terminology
 29 used in health care (Campos 2006). Pictographs or visual aids
 30 using colour and images, as evident in two studies reviewed
 31 (Povlsen *et al.* 2005; Canino *et al.* 2008), can facilitate health
 32 literacy. In future intervention research, there is a need to assess
 33 health literacy of ethnic groups at baseline and follow-up data
 34 collection points. This was not evident in studies examined in
 35 this review. Low health literacy is more common among ethnic
 36 groups than in non-ethnic groups and although little research
 37 attention has been given to examining the impact of health
 38 literacy on health outcomes, there is emerging evidence that
 39 poor health literacy is associated with poorer glycaemic control
 40 and increasing complications among adults with diabetes
 41 (Schillinger *et al.* 2002; Morris *et al.* 2006).

42 In addition, the assistance of professional interpreters
 43 (Povlsen *et al.* 2005) or bilingual educators (Jones *et al.* 2001) is
 44 an important strategy for communicating health information to
 45 ethnic groups (Campos 2006). However, in order to engage with
 46 ethnic groups during the course of an intervention, there is a
 47 need to accommodate their beliefs, values and behaviours in
 48 order to provide cultural context and meaning to health care

information delivered (Kreuter *et al.* 2003). All four studies
 reviewed were found to some extent to accommodate beliefs,
 values and behaviours of ethnic groups. While focusing on the
 cultural perspectives of ethnic groups seems an obvious consid-
 eration in designing interventions in helping them to manage
 childhood asthma or diabetes, the situation is more complex. As
 well as considering cultural traditions of individual ethnic
 groups, there is also a need to consider acculturation of ethnic
 groups. Acculturation is when an ethnic group adopt some
 elements of mainstream culture of people in their country of
 residence (Caballero 2006). Interestingly, Povlsen and col-
 leagues (2005) points to the possibility of ethnic groups adopt-
 ing mainstream cultural norms with reference to the need to
 provide Danish versions of educational material for children
 because of difficulties in mastering the language of their
 parents. This observation was specific to language however and
 cannot be assumed to apply to traditional values and beliefs.
 The potential for ethnic groups to adopt mainstream cultural
 beliefs and values is articulated by Hsueh-Fen and colleagues
 (2004) in an analysis of culture within a dynamic perspective.
 These authors described culture as flexible such that people
 respond to emerging situations by creatively drawing upon,
 evaluating and revising behavioural and conceptual resources.
 Therefore, in intervention research, there is a need to assess
 what beliefs, values and behaviours ethnic groups have adapted
 from mainstream culture, yet, to date, there has been little
 debate on this in the literature.

According to Hsueh-Fen and colleagues (2004), the concep-
 tualization of culture in research can be improved with a deeper
 understanding of the concept. Researchers vary on how culture
 is conceptualized by using different terminology in describing
 strategies to address culture, for example, cultural targeting,
 cultural tailoring and cultural competence (Fisher *et al.* 2008).
 Fisher *et al.* noted that cultural targeting involves implementing
 strategies that reach groups with commonly shared beliefs,
 values and practices. Cultural tailoring involves implementing
 strategies that are programmed to the preferences of individuals
 or groups. Cultural competence, representing a broader per-
 spective of the concept of culture, involves the integration of
 attitudes and behaviours of professionals within a system to
 work effectively in cross-cultural situations.

In our review, the development of a culturally competent
 intervention was described in one study only (La Roche *et al.*
 2006). Interventions in the three remaining studies were
 referred to as being culturally adapted (Canino *et al.* 2008;
 Povlsen *et al.* 2008) or culturally tailored (Jones *et al.* 2006) to
 the ethnic groups being studied. None of the four studies
 reviewed were based on a conceptual or theoretical framework,

and there was little attempt to define these terms however, or to explain how the concept of culture was operationalized in the respective studies. Hsueh-Fen and colleagues (2004) noted a need to strengthen how the concept of culture is used in research by embedding culture into a relevant theoretical framework and using instruments that are culturally sensitive, a consideration addressed in part by La Roche and colleagues (2006) only. Our review supports these recommendations for strengthening the cultural perspectives of future research. However, we add the need for researchers to examine which strategies or components of cultural interventions are most effective in helping children, adolescents and caregivers to manage asthma care or diabetes care in their daily lives. While all studies in this review reported on the effectiveness of interventions in achieving positive health outcomes in ethnic groups, none specifically reported on which cultural components were more or less effective.

A clearer definition of terminology is needed when developing culturally tailored interventions. Clear understanding of what is required in culturally tailored interventions: more than translation and population-specific delivery.

None of the papers reviewed gave a definition of culture. Anderson and colleagues (2003) defines it as integrated patterns of behaviour. Our selected papers did not outline why they choose the populations they did other than being from similar language and ethnic groups.

Although our review has principally been concerned with examining cultural perspectives of interventions for ethnic groups, the findings of the review have implications for practice. The availability of interpreters and bilingual providers along with cultural diversity training for health care staff and culturally appropriate health education could go a long way towards providing culturally specific health care and consequently towards improving health in ethnic minority groups.

Limitations of the evidence base

While this review has offered new insights into an area that has not been explored in the past, there are limitations to the evidence available. As noted in our quality appraisal, specific details on most criteria were not reported including randomization procedures and power calculations of sample sizes. Only two studies were RCTs, which are considered higher ranking in evidence-based knowledge (Centre for Review and Dissemination 2008). Although evidence is limited to four studies, this review provides a basis on which research studies can build on in the future. Widening the search to childhood chronic ill-

nesses beyond asthma and diabetes may have yielded more culturally tailored interventions and is something that should be considered in future reviews.

In all of the studies, it is evident that longer-term follow-up across outcomes is essential. Of particular note is that little attention to psychosocial outcomes has been paid. The African American and Hispanic populations represent higher populations of ethnic minorities but there are notable gaps in the groups studied. There has been little research in Europe as yet but migration is now increasing so this will change to incorporate a wider variety of ethnic groups with which to work. Future research and cultural intervention development should incorporate more training for those delivering the interventions. Training in cultural sensitivity, cultural knowledge, cultural awareness and cultural competence (Papadopoulos & Lees 2002) would strengthen the interventions by reducing disparity in health care.

In conclusion

By systematically reviewing interventions from a cultural perspective for ethnic groups we have highlighted the dearth of these interventions for asthma and more so for diabetes. There are a limited number of interventions published that add to the knowledge on the specific elements of intervention that is needed for effective and sensitive education of other cultures. However, the findings of this review do show promising effects of interventions prompting the need for continued development of cultural education interventions. Ethnic minorities represent vulnerable groups of people using the health system of the Western world; however, in the area of childhood asthma and diabetes, more work is required into identifying which strategies or components of cultural interventions are most effective in achieving positive health outcomes for children, adolescents and/or their families from ethnic groups.

Key messages

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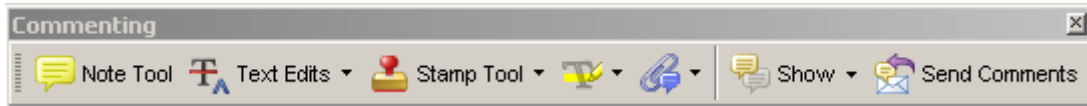
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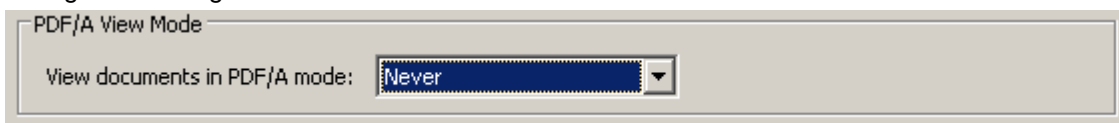
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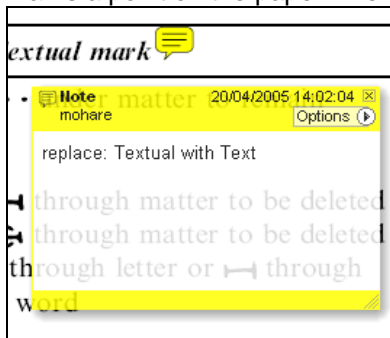
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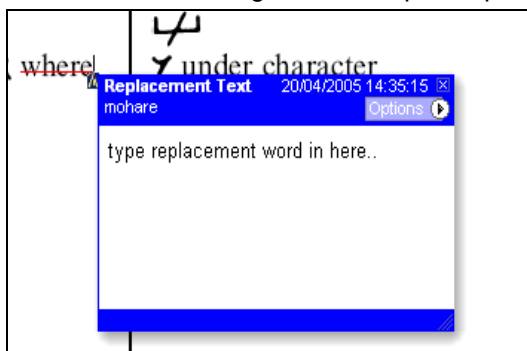


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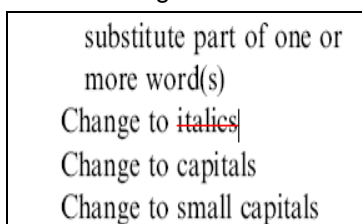


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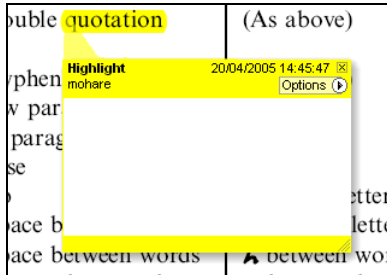


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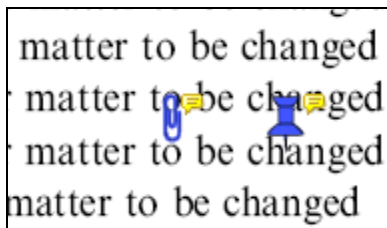


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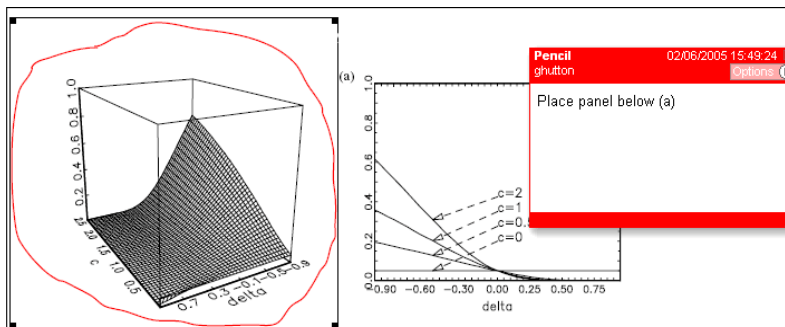


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