

Original citation:

Zeh, Peter, Sandhu, Harbinder, Cannaby, A. M., Warwick, Jane and Sturt, Jackie. (2016)
Exploring culturally competent primary care diabetes services : a single city survey. *Diabetic
Medicine* 33 (6). pp. 786-793.

Permanent WRAP URL:

<http://wrap.warwick.ac.uk/71507>

Copyright and reuse:

The Warwick Research Archive Portal (WRAP) makes this work of researchers of the
University of Warwick available open access under the following conditions.

This article is made available under the Creative Commons Attribution-NonCommercial 4.0
(CC BY-NC 4.0) license and may be reused according to the conditions of the license. For
more details see: <http://creativecommons.org/licenses/by-nc/4.0/>

A note on versions:

The version presented in WRAP is the published version, or, version of record, and may be
cited as it appears here.

For more information, please contact the WRAP Team at: wrap@warwick.ac.uk

Research: Epidemiology

Exploring culturally competent primary care diabetes services: a single-city survey

P. Zeh¹, H. K. Sandhu¹, A. M. Cannaby², J. Warwick¹ and J. A. Sturt³

¹Warwick Medical School, University of Warwick, Coventry, UK, ²Hamad Medical Corporation, Doha, Qatar and ³Florence Nightingale Faculty of Nursing & Midwifery, King's College, London, UK

Accepted 15 October 2015

Abstract

Aims To determine the cultural competence of diabetes services delivered to minority ethnic groups in a multicultural UK city with a diabetes prevalence of 4.3%.

Methods A semi-structured survey comprising 35 questions was carried out across all 66 general practices in Coventry between November 2011 and January 2012. Data were analysed using descriptive statistics. The cultural competence of diabetes services reported in the survey was assessed using a culturally competent assessment tool (CCAT).

Results Thirty-four general practices (52%) responded and six important findings emerged across those practices. (1) Ninety-four per cent of general practices reported the ethnicity of their populations. (2) One in three people with diabetes was from a minority ethnic group. (3) Nine (26.5%) practices reported a diabetes prevalence of between 55% and 96% in minority ethnic groups. (4) The cultural competences of diabetes services were assessed using CCAT; 56% of practices were found to be highly culturally competent and 26% were found to be moderately culturally competent. (5) Ten practices (29%) reported higher proportionate attendance at diabetes annual checks in the majority white British population compared with minority ethnic groups. (6) Cultural diversity in relation to language and strong cultural traditions around food were most commonly reported as barriers to culturally competent service delivery.

Conclusions Seven of the eight cultural barriers identified in the global evidence were present in the city. Use of the CCAT to assess existing service provision and the good baseline recording of ethnicity provide a sound basis for commissioning culturally competent interventions in the future.

Diabet. Med. 33, 786–793 (2016)

Introduction

Diabetes prevalence is particularly high among minority ethnic groups (population groups with an ethnic origin different from that of the majority population of the host country) nationally, presenting substantial challenges to the individual and society. One UK study reported prevalence rates of 11–20% in South Asians and 15% in African Caribbeans, compared with 1–5% in white Europeans [1]. Evidence suggests cultural barriers to optimum health care for minority ethnic groups, primarily due to insufficient cultural competences among National Health Service (NHS) staff [2–4]. The importance of cultural competences in

promoting effective provider–patient relationships and optimizing healthcare provision to minority ethnic groups is well known [4–6].

Coventry is a medium-sized industrial and ethnically diverse UK city, which has areas of affluence alongside pockets of severe deprivation and health inequalities. One in 10 of its population is of minority ethnic origin [7], many of whom live in socially deprived areas with high illiteracy levels [8]. Poor literacy is known to impede access to diabetes care [8], resulting in poor levels of disease self-management, outpatient/education attendance, glucose control and low medication concordance [9].

In November 2011, when this study was undertaken, Coventry had 66 general practices (currently 63) [9], of which 13 were single-handed practices. These were providing health care to 361 893 registered patients, 15 670 (4.3%) of whom live with diabetes. The number of diagnosed diabetes cases in Coventry has since risen to

Correspondence to: Peter Zeh. E-mail: P.Zeh@warwick.ac.uk

This is an open access article under the terms of the Creative Commons Attribution-NonCommercial License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited and is not used for commercial purposes.

What's new?

- Ninety-four per cent of general practices numerically reported the ethnicity of their populations, which compares favourably with previous surveys.
- One in three people with diabetes was from an minority ethnic group compared with one in ten of Coventry's population.
- Seven of the eight cultural barriers to effective diabetes care and management identified in the literature were present in the city.
- Fifty-six per cent of the responding general practices provided highly culturally competent diabetes services to their patients.

18 318 (4.9%) [9]. People of African Caribbean and South Asian origins living in Coventry are three and six times, respectively, more likely than white British people to develop Type 2 diabetes and tend to develop the disease at younger ages [7,10]. The prevalence of diabetes and hypertension in Coventry is believed to be under-reported due to under-screening [10]. Adherence to National Institute for Health and Care Excellence (NICE) Clinical Guideline 66 [11] is difficult to assess, owing in part to ineffective systems and care pathways [10].

The need for inner city Coventry general practices to record patient ethnicity in order to inform the commissioning of culturally competent diabetes interventions has been reported previously [3], and is further strengthened by systematic reviews [12,13]. A culturally competent health-care system is defined as one that acknowledges and incorporates at all levels the importance of culture, assessment of cross-cultural relations, awareness of the dynamics that result from cultural differences, development of cultural knowledge, and tailoring services to meet individual cultural needs [14]. Culturally competent interventions for improving access to health care and diabetes outcomes should be structured, encompassing language, culture, religion and health literacy skills, and tailored to the individual minority ethnic group [13]. Such an intervention has been shown to be successful at improving diabetes-related health outcome measures in both Hispanics and African Americans [15]. At an earlier stage in this project, a culturally competent assessment tool (CCAT) [13] was developed to assess interventions for this purpose. The aim of this study was to examine the cultural competence of diabetes services delivered to minority ethnic groups in a multicultural UK city. This aim was underpinned by the research questions outlined in Table 1.

This article focuses on research questions 1–4 and 8. The remaining three research questions will be reported subsequently.

Table 1 Research questions

1. What is the prevalence of diabetes by ethnicity?
2. What is the range of culturally competent diabetes service provision?
3. What are the barriers to culturally competent service delivery and the utilization of diabetes annual checks?
4. What is the level of cultural competence on self-reported issues within each participating practice?
5. What is the profile of staff from minority ethnic groups employed within each participating practice in relation to whole-time-equivalent posts?
6. What are the linguistic competencies of practice staff?
7. What diabetes training/knowledge is available, and accessible, for practice staff?
8. What are the national and international recommendations for other ethnically diverse cities?

Methods**Survey design**

We used a structured survey comprising mostly closed questions with some free text areas (Table S1), which was informed by two systematic reviews [12,13], survey design methods [16,17] and a 25-question pilot general practice survey [3]. The Warwick Diabetes Research & Education User Group (lay experienced people with diabetes) was consulted about the question content. The study received full ethical approval from the National Research Ethics Service (NRES) Committee West Midlands – Solihull.

Population and data collection

All general practices in Coventry ($n = 66$) were invited to participate. A hard copy of the survey was sent to each practice manager and the senior general practitioner (GP) of each practice, followed by an electronic copy via e-mail, 3 days later, with instructions on how to complete the survey using a third method, online SurveyMonkey (cloud-based software for capturing responses). A second mailing was sent to non-responding practices after 4 weeks. Non-respondents received two follow-up telephone calls after the fourth and eighth week of the initial survey mailings. A £40 incentive was offered to each practice for every completed survey received within 8 weeks and £25 for surveys received between 8 and 12 weeks. A 'thank you letter' was sent to all participants.

Data analysis

All survey data were transcribed into the SurveyMonkey database and then imported into Microsoft Excel software. Descriptive statistical analyses were carried out using Microsoft Excel and SPSS v. 19. Surveys with > 85% ($n > 29$) of questions completed were included in the analysis

and those returned after the deadline of 3 months were rejected. The 10-item CCAT [13] was used to assess the cultural competence of diabetes services described within the survey. Analysis of the free text data used a thematic constant comparative method. Our research questions (1–4 and 8) directly informed our analysis of the survey data.

Results

Response rate

Thirty-four (52%) practices returned the survey and are included in the analysis: seven were completed online, six were returned by e-mail/fax and twenty-one were returned by post. Seventeen of the 32 practices that did not return the survey gave reasons for non-completion, which were mostly low staffing level/staff illness and related practice pressures. One practice refused the incentive payment stating that ‘the survey was an eye-opener to review their internal practice.’

Characteristics of participating general practices

There were few differences between the participating and non-participating practices in terms of diabetes prevalence, practice size and the number of GPs [9]. Figure 1 shows the characteristics of the 34 participating practices. The highest diabetes prevalence was 10% reported by practice 10 (P10). Four practices did not know the number of minority ethnic group patients with diabetes and consequently reported fewer culturally competent diabetes services ($n < 3$). One (P4) of the six single-handed practices had a patient

population of 696, two (P15, P29) had fewer than 1500, another two (P8, P23) had fewer than 2000, and one (P33) had 2500 patients.

Diabetes prevalence by ethnicity

Participating practices represented 209 149 (57.8%) of the total registered patients (361 893) in all 66 practices in Coventry; of these patients, 8789 (4.20%) had diabetes. Thirty-two of the 34 practices (94%) reported recording the ethnicity of their populations, of which 30 (88%) gave information on the number of minority ethnic group patients with diabetes. Of those with diabetes, 2555 (29%) people were from minority ethnic groups; 163 (6.4%) had Type 1 diabetes, 2069 (81.1%) had Type 2 diabetes (including 1043 Indian, 405 Pakistani, 120 Bangladeshi and 264 African Caribbean patients), 45 (1.8%) had gestational diabetes and 274 (10.8%) diabetes of unknown type. Diabetes prevalence in participating practices varied from 0.24% to 10%. No practice reported having no one with diabetes who was a member of a minority ethnic group. Nine (26.5%) (Fig. 2) reported that > 50% of their diabetes patients were from minority ethnic groups, the highest proportion being 96% at P2. Two practices (P16, P20) did not give details of the ethnicity of their minority ethnic group patients with diabetes another two (P12, P26) reported having no South Asian with diabetes, and 6 practices had between 3 and 33 (3.5–38.1%) minority ethnic group people with diabetes. The median number of minority ethnic group people with diabetes in the 34 practices was 43.5 (IQR = 78) compared with 165.5 (IQR = 241) majority white British. That is, for

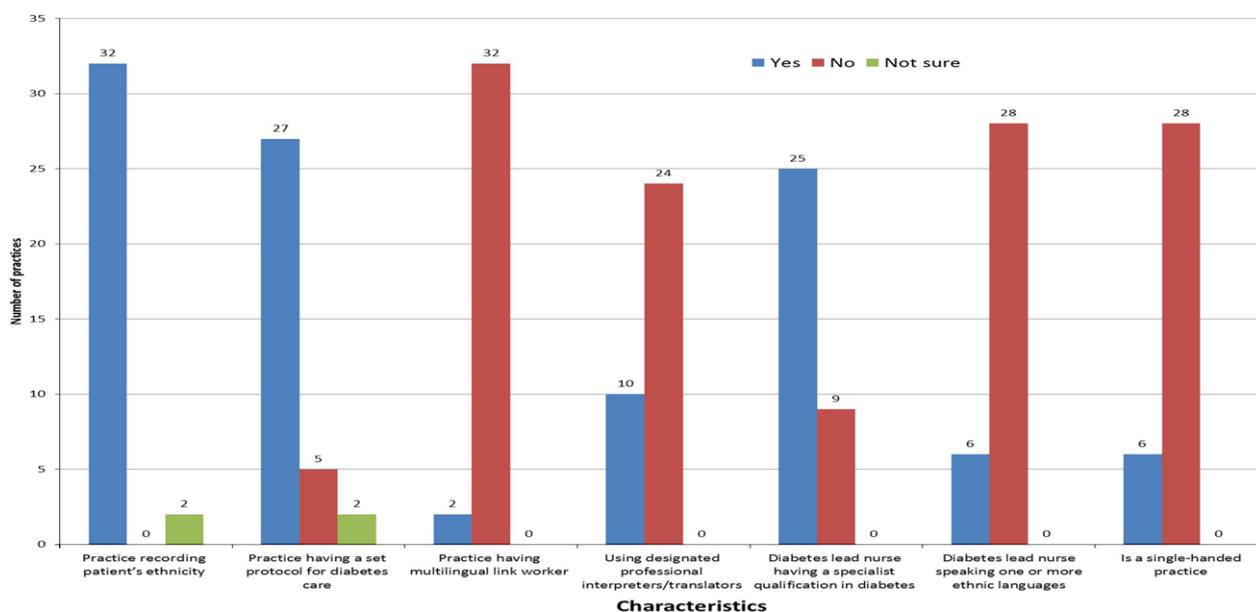


FIGURE 1 Characteristics of participating general practices ($n = 34$).

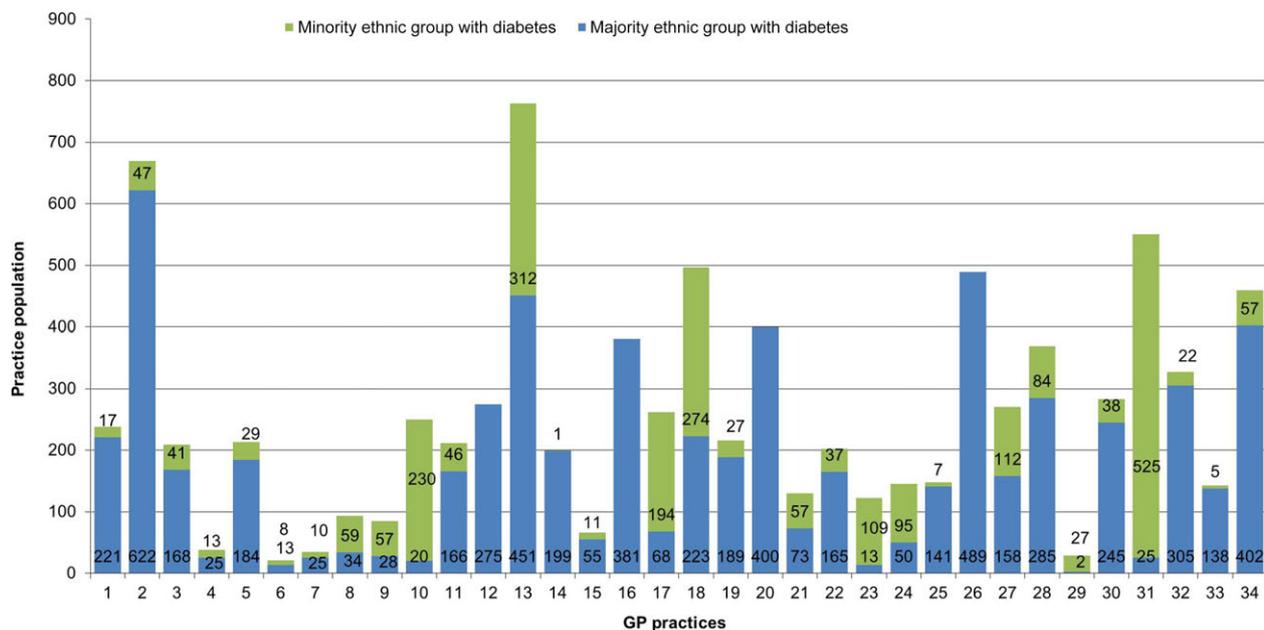


FIGURE 2 Comparison of the relative proportions of diabetes in minority ethnic and majority ethnic groups in each GP practice.

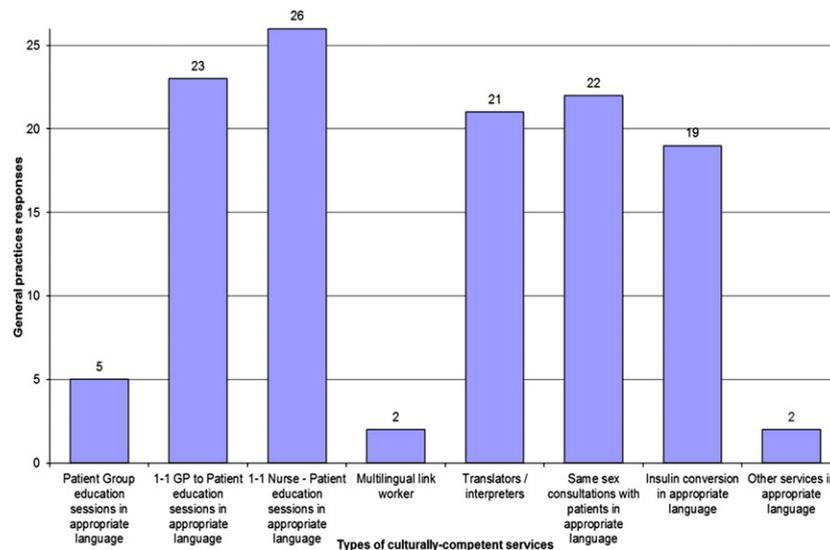


FIGURE 3 Culturally competent diabetes service provision to minority ethnic groups in appropriate language based on 34 practices.

every three people with diabetes living in Coventry, one was from an minority ethnic group.

Culturally competent diabetes services provision

Of the 34 participating practices, 1 reported having no culturally competent services with an appropriate language and 33 reported at least one culturally competent diabetes service (25 provided three services, 5 provided two services and 3 delivered one service). Figure 3 shows the eight culturally competent diabetes services in an appropriate language considered in our survey, with 1–1 nurse–patient

services the most commonly provided ($n = 26$) and the multilingual South Asian link worker model the least common ($n = 2$). Two practices reported dietary advice and retinal photography as other diabetes services delivered using the patient’s primary language.

Eighteen practices (53%) offered educational resources specifically for minority ethnic group patients with diabetes and 16 (47%) were aware of locally available resources for minority ethnic people groups.

Eleven (32%) practices stated that they would consider running new practice or locality-based services in order to ease cultural barriers. A further four (12%) said that they

would only consider running a new practice-based diabetes service and another six (18%) reported that they would prioritize collaborating with other local practices to offer new locality-based diabetes services explicitly to minority ethnic groups.

Barriers to culturally competent service delivery and utilization of diabetes annual checks

Cultural and organizational barriers were identified as contributory factors to the delivery of diabetes care services. Only five practices reported experiencing no cultural issues (Table 2) in their day-to-day interactions with minority ethnic groups with diabetes. Of the remaining 29 practices, the majority (21/29) reported three areas of concern (the maximum allowed in our survey): language ($n = 15$), strong cultural traditions around food ($n = 19$) and patient/provider cultural differences ($n = 20$) being the most common cultural barriers.

Organizational barriers included lack of funding, inadequate cultural competence training and low staffing levels. Some practices stated that they would need additional funding ($n = 21$), training ($n = 23$) and staff ($n = 21$) to implement better culturally competent services. Two practices, which had one and five minority ethnic group people with diabetes, respectively, stated that there was no need for specific services for patients from minority ethnic groups within their practice as they were neither viable nor cost-effective, whereas one practice stated the lack of time and space as reasons for non-implementation. Four of the six (67%) single-GP practices were unaware of locally available

Table 2 Barriers impeding delivery of culturally competent diabetes services

1. Cultural differences between minority ethnic group patients and their service providers, e.g. gender, self-denial of having diabetes based on cultural norms, diverse beliefs about physical exercise, miscommunication between patients and their service providers ($n = 20$).
2. Strong cultural traditions around food ($n = 19$).
3. Language barrier ($n = 15$).
4. Strong religious commitments, e.g. fasting imposing different meal times, refusing to take insulin on the grounds that it is produced from pigs, curative belief of diabetes ($n = 7$).
5. Low concordance issues with medication due to stereotypes around western medications ($n = 6$).
6. Low health literacy level resulting in lack of diabetes knowledge ($n = 5$).
7. Belief in the expert – cultural reliance on healthcare professionals leading to low motivation in diabetes self-management ($n = 3$).
8. High 'did not attend' (DNA) rates in minority ethnic groups ($n = 3$).
9. Variation in overseas prescriptions posing non-adherence in self-medication ($n = 2$).
10. Prefer all clinical services at practice-based level (do not like travelling to different locations) ($n = 1$).
11. Patients' poor social and financial circumstances ($n = 1$).

resources for minority ethnic group people with diabetes. Twenty-one (61%) practices reported staff understanding of the different patients' cultural beliefs surrounding diabetes care services, five (15%) reported inadequate understanding of these beliefs and eight (24%) were unsure.

The did-not-attend (DNA) rates of people with diabetes reported by practices were generally lower in the majority white British population than in the minority ethnic groups (Fig. S1). DNA rates of < 25% were reported for the majority population at 26 (76%) practices and for minority ethnic groups at 21 (62%) practices. Six (18%) practices had DNA rates between 25% and 50% for the majority population compared with 11 (32%) practices for the minority ethnic groups.

Level of cultural competences within general practices

General practices reported data representing 517 practice staff across the city, of whom 164 could speak a second language relevant to the practice's minority ethnic groups. Assessment of the cultural competence of diabetes services within each of the participating practices using CCAT (Table S2) found 19 (56%) practices to be highly culturally competent (scoring 90–100%) and nine (26%) moderately culturally competent (scoring 70–89%). The remaining six (18%) delivered a lower number of culturally competent diabetes services (scoring < 70%) (Table S3).

Discussion

Statement of the principal findings

By exploring general practices' knowledge of their diabetes patients' ethnicity, assessing the cultural competence of the diabetes services they provide, their knowledge about culturally competent diabetes services provision, and the barriers impeding this provision, this single-city survey has identified similar challenges to the delivery of culturally competent health services to those found in existing literature across international multi-ethnic populations [2,4,12,13,18]. Furthermore, our studied population (diabetes prevalence of 4.2%) appears to be representative of Coventry, which has a diabetes prevalence of 4.33% [9] and may be representative of global multi-ethnically diverse cities because the first seven (see Table 2) of the eight cultural barriers identified in the published evidence for effective diabetes care and management to minority ethnic groups [12] were present in Coventry. We found that a disproportionate number of people from minority ethnic groups in Coventry are affected by diabetes, as one in three people of the population with diabetes was from a minority ethnic group, implying that special attention is required to tackle this diabetes health inequality in Coventry and potentially other inner cities.

This survey found that a large proportion of diabetes cases were Type 2 diabetes. This is consistent with the literature

showing a prevalence of over 80% for Type 2 diabetes nationally in the UK and worldwide [19,20].

We found that 94% of practices in our survey numerically reported their patients' ethnicity. This compares favourably with the NHS Scotland document [21], which noted a paucity of ethnicity data in most diabetes registers (~ 30% of practices and community centres recording ethnicity). Increased awareness from pro-active local dissemination of the pilot findings [3] in which ethnicity was poorly reported may have contributed positively to changes in local practice. The good reporting found in this survey may highlight the differential patient needs according to ethnicity and is fundamental for effective commissioning of healthcare services, and should be based on patients' needs and indices of deprivation rather than patient numbers or age. Although challenges were reported across practices, most practice staff were aware of the need to deliver tailored services to minority ethnic group people with diabetes, with referrals made to different providers for services not offered at the patient's registered practice. Two practices reported the lack of viability and cost-effectiveness of implementing specific diabetes services for minority ethnic group patients due to their low numbers, potentially disadvantaging these patients compared with their majority white British counterparts [22]. It is important that such practices have alternative arrangements to facilitate appropriate referrals in line with good practice guidance [20,23,24].

Despite the provision of highly culturally competent diabetes services (56%) in Coventry, comparisons cannot be made with other equivalent cities because no such measurements have been used previously [13]. Furthermore, its impact on patient outcomes is unclear from our data and further work is required to assess how patient clinical and psychosocial issues contribute, as well as patient and staff satisfaction levels [3]. There was some indication that single-handed practices were working in isolation because 67% of them were unaware of other locally available services to minority ethnic group people with diabetes, suggesting that integration, sharing good practice and benchmarking of the diabetes provision may help to improve care.

As in previous studies [12,18,25], the most problematic areas in diabetes service provision to minority ethnic groups were language barriers, knowledge of cultural traditions around food and how services could meet the population's need in this respect. However, scarcity of resources coupled with less culturally competent providers within some practices might partly explain the reason for the variation reported in diabetes service provision as previously cited in other studies [4,13]. An understanding of cultural norms and health beliefs of South Asian people with Type 2 diabetes by linguistically competent health workers has been shown to ensure effective communication, leading to better diabetes health-related outcome measures [26]. It is imperative for education around food and dietary change to be based on the kinds of foods people from minority ethnic groups are

already accustomed to [25,27]. Such initiatives should be negotiated, affordable and culturally sensitive, reflecting the ethnicity and social context of the individuals and in accordance with their religious beliefs to ensure concordance [12,26].

Strengths and limitations

The characteristics and challenges we observed in Coventry (a medium-sized industrial and ethnically diverse UK city) appear typical of many developed world cities such as Bologna (Italy), Tampa (USA) and London in Ontario (Canada). The insights gained in undertaking a primary care services survey of this kind, and the demonstrable efforts of Coventry to meet the health needs of its minority ethnic groups, may signpost the way forward for many other multicultural industrial cities across the world. This was a novel healthcare delivery survey of a whole ethnically diverse city with a high interest factor, involving practices with minority ethnic groups with diabetes, a daunting and challenging area for effective commissioning of healthcare services in Coventry and nationally [3,22]. A population survey method was used to give an opportunity to all practices in the city to share good practices. The survey content was robust and based on published evidence from two systematic reviews [12,13] and other literatures [3,16,17]. Although our response rate of 52% is moderate, there was good publicly available information [9,10] and reasons for non-response were provided by 17 of the 32 non-participating practices.

The scope of this study was limited to healthcare professionals' perspectives only, and similar surveys are warranted to concurrently investigate the views of different patient groups including those from minority ethnic back-

Table 3 Recommendations

1. GP practices should collect the ethnicity data of every patient once and link through healthcare databases and verify at subsequent clinical visits.
2. Include in the healthcare professional training curriculum the eight themes identified in the systematic review as cultural barriers impeding minority ethnic groups from accessing effective diabetes services to enhance health workers' cultural knowledge and facilitate partnership working between patients and their service providers.
3. General practices should measure the cultural competence of their interventions aimed at any minority ethnic group using CCAT [13]. This CCAT could further be validated by general practices on independent and/or observational data aimed at any minority ethnic group healthcare issues within their practices, which proved successful in a previous study [13] as well as the current study.
4. Further studies should consider the views of service users to determine if the reported levels of culturally competent diabetes services across most of the GP practices mirror our findings and its impact on patient important outcome measures.
5. Other health providers for minority ethnic groups could modify and/or replicate the CCAT and this survey method to undertake their own service audits

grounds. Our survey also has limitations in diagnosing individual practice issues relating to barriers to delivering culturally competent care, as well as whether the diabetes rates were due to individual practice's clientele rather than the ratio of diagnoses by minority ethnic vs. white British background. Furthermore, the CCAT assessments were made on self-report data and not from independent assessment or observation, which mitigates against the CCAT scores (Table S2) being altered should the assessment be based on interviews or observation (involving further probing to reach a deeper understanding). In fact, the CCAT was developed in 2012 in the context of minimal UK clinical and commissioning attention to the specific healthcare needs of minority ethnic populations. This field has moved on [28,29] and whilst the CCAT [13] (accompanied by six pages of guidance notes) may be perceived as having a rather simplistic approach to a complex problem, it is nevertheless of continuing value and requires further work to reflect the developing field in relation to delivering and evaluating cultural competence. Lastly, grouping all minority ethnic groups together may be contentious as they may differ markedly in terms of health patterns and the effects of culturally competent interventions, and this in turn may also have affected interpretations.

Conclusion and recommendations for future research

The findings suggest a need to appropriately record patients' ethnicity in order to inform future commissioning of diabetes services. This would enable processes to audit healthcare provision for similar populations in multi-ethnic cities to be developed. To improve culturally competent primary care diabetes services to minority ethnic groups, this survey recommends that (see Table 3).

Funding sources

This study was funded by NHS West Midlands through a research fellowship. However, the views expressed are those of the author(s) and not necessarily those of the funder, the NHS or the Department of Health.

Competing interests

None declared.

Acknowledgments

We would like to thank all those who, in person or online, helped us to realize this study, especially members of the Warwick Diabetes Research & Education User Group and NHS West Midlands Specialist Committee, who peer reviewed the study protocol; Professor Sudhesh Kumar and Professor Annie Young; Dr Neesha Patel, Dr Gulnaz Iqbal, Amanpreet Johal and Richard Dune, who provided practical

guidance or directed us to possible sources of evidence; Dr Peter Barker of Coventry & Rugby clinical commissioning groups (the then NHS Coventry) who granted access to the general practices, and all the 34 general practices who freely and willingly participated in the study, despite their having limited time due to their patient demand and meeting NHS targets, their time is highly commendable. We are also grateful to the feedback received as a result of presenting this study at various meetings.

References

- 1 Baradaran H, Knill Jones R. Assessing the knowledge, attitudes and understanding of type 2 diabetes amongst ethnic groups in Glasgow, Scotland. *Pract Diabetes Int* 2004; 21: 143–148.
- 2 Hawthorne K, Mello M, Tomlinson S. Cultural and religious influences in diabetes care in Great Britain. *Diabet Med* 1993; 10: 8–12.
- 3 Zeh P. Delivering diabetes care to ethnic groups: a pilot general practice survey. *Diabetes Primary Care J* 2010; 12: 280–290.
- 4 Hawthorne K, Robles Y, Cannings-John R, Edwards AG. Culturally appropriate health education for type 2 diabetes in ethnic minority groups: a systematic and narrative review of randomized controlled trials. *Diabet Med* 2010; 6: 613–623.
- 5 Papadopoulou I, Tilki M, Lees S. Promoting cultural competence in healthcare through a research-based intervention in the UK. *Divers Health Soc Care* 2004; 1: 107–115.
- 6 Kleinman A, Benson P. Anthropology in the clinic: the problem of cultural competency and how to fix it. *PLoS Med* 2006; 3: e294.
- 7 Barker C. *Coventry Public Health Report*. Coventry: Coventry Health Authority, 2006.
- 8 Bellary S, Barnett A. Novel approach to managing diabetes and CVD in South Asians. *Diabetes Primary Care* 2007; 9: 307–314.
- 9 Quality and Outcomes Framework [QOF]. *Diabetes Data – Quality and Outcomes Framework Management and Analysis System (QMAS) 1st April 2011 and 1st April 2014*. Coventry: NHS Coventry.
- 10 Grainger C. *The Coventry Time Bomb: the annual report of the Director of Public Health 2009–2010*. Coventry: NHS Coventry, 2010.
- 11 National Institute for Health and Care Excellence (NICE). *NICE Clinical Guideline 66: Type 2 diabetes: the management of type 2 diabetes*, 2008. Available at <http://www.nice.org.uk/nicemedia/pdf/cg66niceguideline.pdf> Last accessed 1 September 2014.
- 12 Zeh P, Sandhu H, Cannaby AM, Sturt J. Cultural barriers impeding ethnic minority groups from accessing effective diabetes care services: a systematic review of observational studies. *Divers Equal Health Care* 2014; 11: 9–33.
- 13 Zeh P, Sandhu HK, Cannaby AM, Sturt JA. The impact of culturally competent diabetes care interventions for improving diabetes-related outcomes in ethnic minority groups: a systematic review. *Diabet Med* 2012; 29: 1237–1252.
- 14 Betancourt JR, Green AR, Carrillo JE, Ananeh-Firempong O. Defining cultural competence: a practical framework for addressing racial/ethnic disparities in health and health care. *Public Health Rep* 2003; 118: 293–302.
- 15 Joshi R, Joshi N, Helmuth A. Improving ambulatory diabetes care in high-risk racial minorities: use of culture-specific education and close follow-up. *Endocrin Pract* 2010; 16: 171–177.
- 16 Bowling A. *Research Methods in Health: Investigating health and health services*, 3rd ed. Maidenhead: McGraw Hill/Open University Press, 2009.

- 17 LoBiondo-Wood G, Haber J. *Nursing Research: Methods and critical appraisal for evidence based practice*, 7th ed. Maryland Heights, MO: Mosby, 2009.
- 18 Fleming E, Gillibrand W. An exploration of culture, diabetes, and nursing in the South Asian community: a metasynthesis of qualitative studies. *J Transcult Nurs* 2009; **20**: 146–155.
- 19 Centers for Disease Control and Prevention. *National Diabetes Statistics Report: Estimates of diabetes and its burden in the United States*, 2014. Atlanta, GA: U.S. Department of Health and Human Services, 2014.
- 20 Diabetes UK. *Diabetes: Facts and Stats – guidelines*. Version 3. London: Diabetes UK, 2014. Available at <https://www.diabetes.org.uk/Documents/About%20Us/Statistics/Diabetes-key-stats-guidelines-April2014.pdf> Last accessed 1 August 2015.
- 21 NHS Health Scotland. *Diabetes in Minority Ethnic Groups in Scotland: A report by the National Resource Centre for Ethnic Minority Health in collaboration with the Scottish Diabetes Group*. Glasgow: NHS Health Scotland, 2004.
- 22 Roberts S. *The Way Ahead: The Local Challenge*. London: Department of Health, 2007.
- 23 Department of Health. *National Service Framework for Diabetes: Standards*. London: Department of Health, 2001.
- 24 Department of Health. *The NHS Constitution for England*. London: Department of Health, 2010.
- 25 Lawton J, Ahmad N, Hanna L, Douglas M, Bains H, Hallowell N. ‘We should change ourselves, but we can’t’: accounts of food and eating practices amongst British Pakistanis and Indians with type 2 diabetes. *Ethnicity Health* 2008; **13**: 305–320.
- 26 Hill J. Management of diabetes in South Asian communities in the UK. *Nurs Stand* 2006; **20**: 57–64.
- 27 Goody C, Drago L. Using cultural competence constructs to understand food practices and provide diabetes care and education. *Diabetes Spectrum* 2009; **22**: 43–47.
- 28 Ricci-Cabello I, Ruiz-Pérez I, Rojas-García A, Pastor G, Rodríguez-Barranco M, Gonçalves D. Characteristics and effectiveness of diabetes self-management educational programs targeted to racial/ethnic minority groups: a systematic review, meta-analysis and meta-regression. *BMC Endocrine Disord* 2014; **14**: 60. Available at <http://www.biomedcentral.com/1472-6823/14/60> Last accessed 1 August 2015.
- 29 Sidhu M, Gale N, Gill P, Marshall T, Jolly K. A critique of the design, implementation, and delivery of a culturally tailored self-management education intervention: a qualitative evaluation. *BMC Health Serv Res* 2015; **15**: 54.

Supporting Information

Additional Supporting Information may be found in the online version of this article:

Figure S1 Comparison of DNA rates in diabetes annual checks in majority and minority ethnic groups.

Table S1 The General Practice Service survey on minority ethnic groups with diabetes.

Table S2 Assessment of cultural competence level of general practices using the tool proposed by Zeh *et al.* (2012).

Table S3 Culturally competent assessment tool for health-care interventions in minority ethnic groups by Zeh *et al.* (2012).