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Review Article Title

The impact of culturally-competent diabetes care interventions for improving diabetes-related outcomes in ethnic minority groups: A systematic review

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Abstract

Aim: To examine the evidence on culturally-competent interventions tailored to the needs of people with diabetes from ethnic minority groups.

Methods: Medline (NHS Evidence), CINAHL and reference lists of retrieved papers were searched from inception to September 2011 and two NHS specialist libraries. Google, Cochrane and DARE databases were interrogated, and experts consulted. Studies were included if they reported primary research on the impact of culturally-competent interventions on outcome measures of any Ethnic Minority Group with diabetes. Paper selection and appraisal were conducted independently by two reviewers. The heterogeneity of the studies required narrative analysis. A novel culturally-competent assessment tool (CCAT) was used to systematically assess the cultural competency of each intervention.

Results: 320 papers were retrieved and eleven included. Study designs varied with a diverse range of service providers. Of the interventions, 64% were found to be highly culturally-competent (scoring 90%-100%), and 36% moderately culturally-competent (70%-89%). Data were collected from 2616 participants on 22 patient reported outcome measures. A consistent finding from ten of the studies was that: any structured intervention, tailored to Ethnic Minority Groups by integrating elements of culture, language, religion, and health literacy skills, produced a positive impact on a range of patient important outcomes.

Conclusions: Benefits in using culturally-competent interventions with Ethnic Minority Groups with diabetes were identified. The majority of interventions described as culturally-competent were confirmed as so, when assessed using the CCAT. Further good quality research is required to determine effectiveness and cost-effectiveness of culturally-competent interventions to influence diabetes service commissioners.

Key words: culturally-competent diabetes care, diabetes, ethnic minority groups, health worker, service delivery

Abbreviations: AAs (African-Americans); ALWs (Asian link workers); BMI (body mass index); BP (blood pressure); CCAT (Cultural-Competent Assessment Tool); DSME (Diabetes self-management education); DSNs (diabetes specialist nurses); EMGs (ethnic minority groups); HbA1C (Glycosylated haemoglobin); HCPs (health care professionals); HV (Health visitors); ITT (intention to treat); NHS (National Health Service); NICE (National Institute for Health and Clinical Excellence); QALY (quality-adjusted life years); RCT (randomised control trial); RD (registered dietitian); SAs (South Asians); T1DM (type 1 diabetes mellitus); T2DM (type 2 diabetes mellitus); WMS (Warwick Medical School); £ (British pounds).

1. Introduction

The burden of diabetes disproportionately falls on ethnic minority groups who recurrently experience higher morbidity and mortality than majority populations due to complex cultural, physiological and linguistic reasons (1-4). They do not always receive adequate diabetes care due to barriers such as linguistic difference, limited educational backgrounds, and religious, health and illness beliefs that are not familiar to the majority population; thus predisposing them as vulnerable groups within their host country health care systems (5). Some authors have argued that the provision of appropriate interventions by culturally-and linguistically-competent healthcare professionals (HCPs) can confer important benefits, not only to people with diabetes and their families but can also bring about cost savings in every nation's healthcare system (6).

Ethnic minority groups are defined as a population group with an ethnic origin different from that of the majority population of the host country (7, 8). Cultural competence in healthcare service delivery is present when *'individuals and systems respond respectfully and effectively to people of all cultures, languages, classes, races, ethnic backgrounds, religions, and other diversity factors in a manner that recognises, affirms, and values the worth of individuals, families, and communities and protects and preserves the dignity of each* (9)'. For health interventions, defined broadly as care or services delivered to people in a research setting, to be culturally-competent and successfully implemented by cultural groups, healthcare workers need an awareness of cultural differences and are required to deliver healthcare services in an effective and compassionate manner, maximising sensitivity and taking into account the patients' cultural beliefs, behaviours and needs (10). This is because each culturally diverse group defines health and illness differently (11, 12).

Five previous systematic reviews have focused on reviewing culturally-competent education interventions in Ethnic Minority Groups (EMGs) with diabetes and reported varied effects in health-related outcomes (13-17). These reviews found that structured diabetes education programmes are central to effective diabetes self-management (15, 16). Culturally-competent health education and case management models have some benefits over 'usual' care in improving glycaemic control and/or diabetes knowledge but their long-term effects and sustainability on patient-centred and clinical outcomes are unknown (13, 17). Furthermore, another review suggested that diabetes self-management interventions effective in the general population, when modified to be culturally-competent, can improve health-related outcomes in Ethnic Minority Groups (14)**.** However, little is known about (a) what components and implementation process constitutes a

culturally-competent intervention and (b) what is the impact of culturally-competent interventions for ethnic minority populations with diabetes (16, 17).

2. Methods

Eligibility

Studies were eligible for inclusion if they reported primary research on the impact of culturally-competent interventions on any outcome measures to any ethnic minority population within a majority population globally with any type of diabetes. No publication date or language restrictions were employed. Studies were excluded, which did not focus on an ethnic minority group within a majority population.

Search strategy

The search strategy (table 1) aimed to identify all references to diabetes, cultural competence and Ethnic Minority Groups. The following databases were used from inception to September 2011: CINAHL and MEDLINE (NHS Evidence). In addition, searches using MeSH and key words were conducted using: Cochrane and DARE databases, the two NHS specialist libraries hosted at Warwick University for ethnicity and health (www.library.nhs.uk/ethnicity) and diabetes (www.library.nhs.uk/diabetes), including the Warwick Medical School (WMS) Research Publications from 2004 to 2011 (http://www2.warwick.ac.uk/fac/med/staffintranet/staffresources/researchpublications/&NoOfYears=5). The reference lists of included studies and relevant review articles were screened for additional citations, and Google Scholar searched for grey literature. Four UK-based experts were consulted: in diabetes and Ethnic Minority Groups (n=1), diabetes and cultural-competence (n=2), and cultural-competences (n=1) to identify additional studies, and Google hand searches for any relevant papers written by three of these experts.

Table 1: Search strategy

Selection criteria

Abstracts were independently screened for eligibility by two reviewers, and disagreements resolved through discussion and consensus or third opinion. Agreement level was calculated using Cohen's Kappa to test the inter-coder reliability of this screening process. The PRISMA flow diagram (figure 1) shows the detailed results of the screening and selection process (18).

Figure 1: Flow diagram of included studies

Assessment of culturally-competent interventions

Literature searches and consultation with experts were undertaken to identify tools for assessing cultural-competence of interventions, but no existing tools were identified. Papadopoulos et al's (1998) Model for the 'Development of Transcultural Competence' [(19)] was therefore used as a basis from which a tool was developed for testing the cultural competency of health care delivery interventions, called the Cultural-Competent Assessment Tool (CCAT) (table 2 online). Ten culturally-competent criteria were formulated to systematically determine culturally-competence within our review interventions. The CCAT was piloted, then used to assess study inclusion. A standard was set stating that cultural competence is achieved when a score of ≥70% is attained.

Data extraction and quality assessment of studies

Data extraction was piloted by PZ and amended in consultation with the research team. Data extraction included authors, year and country of publication, study aims, setting, intervention aims, number and ethnicity of participants, study methods, intervention components and delivery methods, comparison groups and outcome measures, notes and follow-up questions for the authors. Missing data were clarified with three authors. Included studies were quality assessed using Moher et al [(20)] for experimental studies, Popay et al [(21)] for the action research and qualitative studies and the Critical Appraisal Skills Programme (22) for retrospective studies. Individual quality assessment tools enabled us to focus on the specific study designs appropriately.

3. Results

Available evidence

The searches identified 320 papers (Figure 1). Fifty-seven potentially relevant abstracts were identified and full paper obtained, which were all in English. Eleven studies were included. The inter-coder reliability of the screening process was high (Kappa score 0.93). Forty were excluded because they were not culturally-competent interventions delivered to Ethnic Minority Groups with diabetes. Following third opinion, an additional six studies were excluded because they were not explicitly related to Ethnic Minority Groups with diabetes or culturally-competent or research. There was considerable heterogeneity among the included studies, therefore a narrative synthesis of the evidence was undertaken.

Characteristics of studies

Of the eleven included studies (table 3), there were five randomised-controlled trials (RCTs) (23-27); two qualitative action research studies (5, 28) and two retrospective cohort studies (29, 30); one quasi-experimental design study (31); and one qualitative study involving focus groups/interviews (32). Studies were conducted in the UK (n=6), USA (n=3), Denmark (n=1) and Austria (n=1). 2616 participants were recruited; African-Americans (n=182), African-Caribbean (n=22), Asians (n=165), Bangladeshis (n=42), non-specified ethnic minority participants (n=37), Hispanics (n=174), Russians (n=55), Turkish (n=39), with South Asians (n=2000) being the majority group studied from four UK-based RCTs. Nine studies included adults with type 2 diabetes (n=2540), one involved children with Type 1 Diabetes (n=37) (5), and another studied women with gestational diabetes (n=39) (29)

Table 3: Studies included in the review

Risk of bias

Three of the experimental studies were of A quality (23, 25, 27) with the remainder (24, 26, 31) of B quality using Moher et al's criteria (Table 4) (20). All the trials clearly described withdrawal and dropout rates, including follow-up methodologies, and presented the interventions' outcome results. Three trials (23, 25, 27) included power calculations and these were greater than 80%. These studies also reported results by intention to treat. The flow of participants was not represented in a consort style diagram in two studies (26, 31). There were no allocation concealments of participants and intention to treat analyses were unclear in two RCTs (24, 26). All six studies were conducted in only two countries, UK (n=4) and USA (n=2). Overall quality assessment of the eleven studies found 5 of the studies to be good quality (scored A) (5, 23, 25, 27, 30) by meeting >79% of the quality criteria and 6 of moderate quality (B), meeting 50%-79 of the quality criteria (tables 5-6 online).

Table 4: Risk of bias assessments in experimental studies

Cultural competence of interventions

The CCAT was used to assess the interventions, which found 64% (n=7) of the interventions to be highly culturally-competent (scoring 90%-100%). The remaining 36% (n=4) were moderately culturally-competent by scoring 70%-89% (table 7 online). Five studies described their

interventions as fully culturally-competent (24, 26, 30-32), which were confirmed when assessed systematically using the CCAT.

Development and types of interventions

All eleven studies were complex interventions composed of components acting independently and/or interdependently (33). Four interventions were one-to-one, (23, 25, 29, 30), four used group sessions only (24, 27, 28, 32), and the other three applied both approaches (5, 26, 31).

Components and delivering of interventions

In two studies involving Bangladeshi subjects, pictorial and videos were used for teaching/learning (27, 28). Two USA studies with African-Americans successfully used financial incentives to recruit and retain participants (26, 31). Three of eleven studies (27, 28, 32) implemented informal learning methods amongst peers; however, in the one using unstructured learning, the primary outcome measures did not improve when compared with the control group (27).

The number and duration of intervention sessions varied. In the group education sessions, one intervention offered a one-off session lasting 2.5 hours (32), one implemented 3 sessions of 1-1.5 hours per participant over 3 months (24), and other two offered fortnightly 2 hours sessions over 6 months (27) and 10 formal programmes consisting of 3 hours per participant over 12 weeks (28), respectively. Of the four interventions that provided individualised sessions, one was extra nurse resources of 4 hours per week (25), two unspecified weekly support of extra nurse resources (23), and dietitian/nurse educator resources (29). The other study undertook between one and six internal medication clinic visits annually (30). The three studies (5, 26, 31), which used mixed delivery method approaches comprised of: one-one sessions of three meetings lasting 10-15 minutes per participant along with the group sessions of 2 hours weekly per group over 8 weeks (31); one provided 8 group meetings over 10 months and unspecified individualised sessions to four families, where an ethic group could not be formed (5). The other implemented either four intensive education sessions in groups or one-one, totalling 10-16 sessions per patients (26). Apart from two studies (30, 32), all the interventions clearly reported a follow-up period; the shortest was ten weeks (31), and the longest two years (25, 26).

Nine interventions were delivered in primary and community care settings (5, 23-28, 30, 31). Of these, three were also delivered in hospital care settings (OPD) (26, 27, 30). Two studies (29, 32) delivered their interventions exclusively in hospital settings. Three UK-based studies (23, 25, 32)

used multilingual Asian link workers (ALWs). Three interventions (26, 30, 31) had their providers from the same ethnic backgrounds as the participants. Two used Bilingual Health Advocates to deliver their interventions (27, 28). The other three studies utilised providers with varied competences; two experienced bilingual health educators (24), an experienced nurse in diabetes and Muslim customs supported by interpreters (5), and a dietitian and nurse educator, supported by a translator (29). The settings, service providers and model of delivering were similar in the two nurse-led interventions (23, 25).

Training to deliver culturally-competent interventions

Six studies explicitly described the diabetes cultural competence-related training of the interventionists, of which four comprised of cultural competencies and/or standardised chronic disease management (25, 26, 31, 32); two of cultural-competence training programmes and story-sharing models using accredited curriculum over 12 weeks (27, 28). All eleven studies mentioned the qualifications of the service providers, which varied from primary education to degree level. In five studies, providers were certified to a minimum of registered nurse/dietitian level (5, 24, 26, 29, 31), and one was a medical doctor (30). One intervention (5) was delivered by a nurse experienced in diabetes care, immigration and Muslim customs with support from interpreters and clinical dietitians. The diabetes-related training in the link worker's study (23) was unclear. The link worker's roles were mainly limited to liaison and interpretations. The primary providers in three studies (5, 23, 29) appeared not to be linguistically-competent by using interpreters/translators. Overall, the USA studies provided greater details about the training of their interventionists. Nonetheless, eight studies reported successful use of locally available culturally-appropriate media/communication tools including the engagement of community or religious leaders to access participants to maintain motivation including the use of delivery staff from the same ethnic backgrounds as participants (23, 25, 26, 28, 30-32).

Diabetes-related outcome measures

Across the eleven studies, twenty-two outcomes were reported, including; 12 clinical, five psychosocial, three lifestyle and two health care utilisation. Of these, five were objectively measured (e.g. HbA1c), eight were self-report (e.g. satisfaction with care) and nine measured by the research or clinical team (e.g. BMI). All but one study (27) reported at least two positive impacts on their participants diabetes-related outcomes.

Impact on clinical outcomes

HbA1C was the main clinical outcome of interest and was reported in nine of the eleven included studies: Four of the RCTs evaluated Hb1AC changes (23, 25-27), with only one (26) reporting statistically significant between group changes in both Hispanics (decreased from 80mmol/mol (9.5%) to 65mmol/mol (8.1%), P=0.004) and African-Americans (92mmol/mol (10.6%) to 66mmol/mol (8.2%), P<0.001). There were no improvements in HbA1C in the other three RCTs. Four RCTs (23, 25-27) also evaluated total cholesterol levels and blood pressure (BP). Statistically significant total cholesterol reduction in the intervention groups compared with controls were reported in two RCTs: at immediately post-intervention, there was an 18% (P=0.003) reduction in the number of Hispanic participants with total cholesterol over 200 mg/dl (26), and at one year a reduction of 0.4mmol/l, P=0.005 in the studied South Asian population(23). The reduction in diastolic BP was statistically significant in two RCTs (23, 25) with changes in the intervention groups compared with controls lowered by 3.4 mmHg (P=0.003) at the end of the one year period in one RCT (23), and after two years a reduction of 1.6 mmHg, P=0.007) in the other RCT (25). The only quasi-experimental study (31) found small HbA1C improvement in both the Group and Individualised Diabetes Self-management. One of the two action research studies (5) measured HbA1C changes, which decreased significantly immediately post-intervention (from 77mmol/mol (9.2%) to 70mmol/mol (8.6%), P=0.01), when compared with baseline parameters but was not sustained at the six month follow-up (increased to 76mmol/mol (9.1%). The second action research study commented that glucose concentration of 'active participants' did improve (28). Only one of the two retrospective cohort studies (30) reported statistically significant changes in HbA1C (decreased from 68mmol/mol (8.4%) to 64mmol/mol (8.0%); P=0.007). No significant differences between the groups were reported by the other study (29).

Impact on knowledge, attitude change and self efficacy
Only one of the RCTs (24) assessed diabetes knowledge, attitude towards seriousness/complications and self-care practices. Immediately post-intervention, the mean improvement changes between the ethnic intervention and control groups respectively were reported as: knowledge (1.72 (5.4), 0.47 (4.5); P=0.27); attitude towards seriousness (1.21 (2.4), 1.38 (2.2); P=0.76); self care practice (1.02 (2.2), 0.26 (3.2); P=0.23), showing no significant between group differences. A qualitative study reported a small improvement in knowledge and attitude towards seriousness to diabetes care (5). These authors, who report that the educational materials and topics were received with enthusiasm, though many of its topics were considered 'difficult' by participants, found that their intervention was successful in terms of participants citing what they had learnt from the education programme and how it met their needs. The quasi

experimental study (31) found an increase change scores on measures of self-efficacy over the 10-week study duration in the intervention groups for participants receiving the Group DSME (+3.58 (5.43)) over Individual DSME, which were reduced (-1.13 (7.12); P=0.111) although the reduction was not statistically significant. A further qualitative study reported improvement in patient knowledge and outcomes (32). In relation to health behaviour, one study (5) reported significant differences between the families associated with culture. The general attitude of participants varied, with some not liking to work with peers in groups and had to be provided with individualised education sessions, which had time and resources implications.

Evaluation of cost effectiveness

Only one study formally assessed the cost-effectiveness of their intervention (25). It analysed programme cost of £434 per patient over 2 years, and calculated cost in terms of Quality-adjusted life year (QALY), which equated to an incremental cost-effectiveness ratio of £28,933 per QALY gained compared well with National Institute for Health and Clinical Excellence (NICE) suggestive norm of £30,000 per QALY (34). The little cost savings were offset by increased consultation length of 4 hours weekly of additional nurses' input. One of two studies estimated annual cost per patient at £365 compared with £264 for treating type 2 diabetes (23), and the other estimated the cost of training Bilingual Healthcare Advocates or volunteer as group facilitator at £1500 and £345 to deliver the 12-week story-sharing course per patient (27).

4. Discussion

Statement of main findings

Our review found a small number of papers of heterogeneous research design. Ten of the eleven included studies reported at least two positive impacts on a wide range of patient level diabetes outcomes. This success was found in the interventions which were structured, coupled with the fact that the service providers adapted teaching and learning methods which met cultural and community needs, fundamental to good care (17). Whilst short term improvements were observed in some studies in clinical and psychosocial outcomes, these changes were short lived. There is some indication that knowledge improves as a result of culturally-competent intervention. All studies were of moderate or good quality in relation to the characteristics of their particular design. South Asian communities were the focus of diabetes-related culturally-competent intervention research in the UK and African-Americans in the USA studies. These groups are the sizeable minority populations in many countries worldwide, and are among the most susceptible to diabetes and related complications in both countries (16, 35).

Strengths and limitations

The search criteria of this review included all Ethnic Minority Groups with all types of diabetes and culturally-competent interventions globally. Interventions of any research design, (from wide range of sources including experts), were assessed and included, which were culturally-competent, using the novel CCAT, to ensure the inclusion of all relevant interventions previously undertaken in the area. Therefore, this design was robust because previous systematic reviews have limited their search to specific Ethnic Minority Groups (14, 15, 36) or study types (13, 17) or type 2 diabetes (14, 16, 17), and have not formally assessed the level of cultural competence in interventions. The included eleven studies were assessed for both methodological quality and cultural-competence. The review is limited by the different methodological studies. The lack of age restriction of participants posed a challenge in drawing of any conclusive views due to the heterogeneity of the populations. In addition, as only published studies were included, some relevant ongoing studies may have been excluded. The definitions of 'ethnic minority groups' and 'culturally-competence' have been signposted in this review. However, these terms have been recognised as having no unique meanings (7, 9).

The CCAT performed well as a tool to assess the cultural competence of the included studies. It was developed alongside the review and its content was informed by the contextual data surrounding the interventions under scrutiny. In this way the review informed the CCAT and may well account for its success in determining that the included studies were delivering interventions with a strong basis of cultural competence. The CCAT is not diabetes specific and theoretically could be used to assess the cultural competence of interventions aimed at any ethnic minority health care population. It could also be used to inform the development of a new culturally-competent intervention and the next steps in its development is to undertake some of this work to further test its validity and reliability. However, further empirical refinement of concepts within the CCAT is required.

Findings in relation to other studies

No specific trends were identified in terms of interventions that can produce notable improvements in HbA1C in the South Asian (SA) populations. A previous review involving this population had suggested that trials of longer durations may have a significant improvement in glycaemic control in this group (16). However, the two similar nurse-led interventions, which studied SAs with one year follow-up (23) and two years follow-up (25), using 361 and 1486 participants respectively to

evaluate HbA1C changes produced similar outcomes. This may be explained by the use of the link worker model which meant that communication between the patients and the primary providers was sometimes indirect. The two USA studies (26, 30) where communication was direct as primary providers, produced statistically significant improvements in HbA1C, albeit of limited duration. These two studies (26, 30) that reported the most statistically significant diabetes-related improvements used dual interventions settings (community and hospital). Their delivery providers were highly trained in diabetes management and belonged to the same Ethnic Minority Groups as the participants, therefore, they were linguistically-and-culturally-competent. However, it would appear that the reported outcomes might have come from delivering the interventions over a longer period because following the same procedure for a shorter period (31), only produced small benefits. This has been confirmed in other diabetes-related reviews, which recommended that results reported immediately following an intervention or those after a brief follow-up period have limited reliability for informing commissioning decisions (17, 37).

Communication

Communication in relation to intervention delivery and the assessment of outcome may both impact on the findings of these studies. The results of this review showed that communication between service providers and participants in some interventions were indirect, necessitating the use of Link Workers or interpreters/translators. The evidence suggests that communication barriers may inhibit the uptake of the intervention and the use of psycho-social and knowledge assessment tools which are essential in determining the effectiveness of diabetes-related interventions (15, 38). They argue that communication must not only be seen in terms of linguistic barriers because our health-seeking behaviour is influenced by our cultural backgrounds, belief systems and identity as well as our past experiences in our countries of origin. Translators/interpreters may not, in all cases, be able to understand the communications of some of the patients or their providers and the meaning of what would have been said will be misleading. As some participants were found to be illiterate in one study (29), the proposed remedy to this, is the use of tools such as audio-video methods of delivery with SAs (39, 40).

5. Conclusion and recommendations for future research

The findings suggest a need for a robust research agenda on culturally-competent interventions in diabetes care services. The presence of cultural-competency components in every healthcare service intervention should be assessed to ensure it meets the needs of specific ethnic minority populations. The CCAT can be further evaluated and strengthened to inform this agenda. As not all

the intervention providers had formal training in diabetes and cultural competence, it is unclear of the resource needed to ensure successful interventions. Therefore, further studies are needed to investigate if formal culturally-competent training for diabetes service providers generally produces a positive effect in diabetes-related outcomes in ethnic minority populations. Limited evidence on cost-effectiveness is available and we recommend that culturally-competent interventions should include cost-effectiveness evaluation in their designs at the outset. Such findings may then be used to inform future commissioning of diabetes services and buy-in by its commissioners (17). Furthermore, culturally-competent diabetes service interventions involving Ethnic Minority Groups should be designed to evaluate the satisfaction levels of patients and service providers which may improve patient concordance and providers' job satisfaction (3). Healthcare organisations should have culturally-competent staff and services, which should result to positive health outcomes to Ethnic Minority Groups (41). Whilst there are some benefits for Ethnic Minority Groups to conserve their cultural identities within their host nations, service providers should learn and be aware of the Ethnic Minority Groups cultural and linguistic needs to ensure that their perceived healthcare needs are met in a sensitive manner. Ethnic Minority Groups should be encouraged and assisted by service providers towards community integration of their host nations. Although challenging, the pursuit for culturally-competent health-care systems in every nation requires further investigation to meet the increasingly needs of Ethnic Minority Groups (42).

Ethics committee approval

None required

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Tables

Table 1: Search strategy

Search terms
Unless otherwise specified, search terms are free text terms; MeSH for Medical Subject Headings (CINAHL and MEDLINE medical index terms); exp = exploded MeSH; adj = adjacent; ti,ab = title, abstract; * = truncation
'Diabetes' search terms:
exp DIABETES MELLITUS/ OR exp DIABETES MELLITUS, EXPERIMENTAL/ OR exp DIABETES MELLITUS, TYPE 2/; (diabet*2 adj2).ti,ab; NIDDM.ti,ab; T2DM.ti,ab; (gestational AND diabetes*).ti,ab; (Juvenile AND diabetes*).ti,ab; Diabet*1adj1.ti,ab; (Type AND 1 AND diabetes*).ti,ab; T1DM*.ti,ab; IDDM*.ti,ab; exp DIABETES MELLITUS/ OR exp DIABETES MELLITUS, TYPE 2/
"Cultural competence" search terms:
culture*.ti,ab; (cultural AND competent*).ti,ab; (language AND barrier*).ti,ab; exp COMMUNICATION BARRIERS/ OR exp INTERDISCIPLINARY COMMUNICATION/ OR exp NONVERBAL COMMUNICATION/ OR exp COMMUNICATION/ ; (NHS AND healthcare AND systems).ti,ab; (NHS AND health AND care AND systems).ti,ab; (delivery AND healthcare).ti,ab; exp HEALTH SERVICES ACCESSIBILITY/; exp CULTURAL DIVERSITY/ OR exp CULTURAL COMPETENCY/ OR exp HEALTH SERVICES ACCESSIBILITY/ OR exp NURSING STAFF/ ; (religious AND beliefs*).ti,ab; (cultural AND awareness*).ti,ab; (cultural AND characteristics*).ti,ab; multicultural*.ti,ab; transcultural*.ti,ab; crosscultural*.ti,ab
"Population" search terms:
gujerat*.ti,ab; bengal*.ti,ab; exp ASIA, WESTERN/; exp INDIA/; bangladesh*.ti,ab; gujarat*.ti,ab; pakistan*.ti,ab; (south*adj2 AND asian*).ti,ab; ((south*adj2 indian*)).ti,ab; Punjab*.ti,ab; Urdu*.ti,ab; Hindi*.ti,ab; Hindu*.ti,ab; (African ADJ Caribbean).ti,ab; (ethnic AND minorities).ti,ab; (ethnic AND minority AND groups).ti,ab; human*.ti,ab

Table 2 Online: Culturally-Competent Assessment Tool (CCAT) for Healthcare Interventions in Ethnic Minority Groups

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The questions are designed taking into considerations the Papadopoulos, Tilki & Taylor (1998) Model for 'Developing Transcultural Competence [19].'

The following 10 questions are designed to help guide your decision systematically on the level of culturally-competent care service intervention:
- The first two questions are screening questions, which can be answered quickly. If the answer to both is 'yes', then you should proceed to the remaining questions. If the answer to questions 1 and 2 is 'no', the intervention is not culturally-competent.
- There is some overlap between some questions which is deliberate.
- Please tick the appropriate answer to each question. A number of italicised prompts are provided after each question. These are designed to remind you why the question is important. Note that where a 'yes' answer is provided, the entire score should be awarded.
- For an intervention to be culturally-competent, the answer must be 'yes' to numbers 1 and 2 and at least 5 or 6 other questions in 3 – 10 below.

Assessment Factors for Culturally-Competent Care Interventions

1. Does the intervention have a clear focus on ethnic minority groups?
Yes [ ] No [ ] Unclear [ ]   10% [ ]

HINT: *Consider most of the following*
- ✓ *The studied population must be the minority of the majority population of the host country*
- ✓ *The primary aim/objectives of the intervention must be clearly defined to the culturally-competent element or elements*
- ✓ *An element of specific Ethnic Minority Groups culture must be described*
- ✓ *Delivery staff group or health workers should be made clear*

2. Is the intervention sensitive to specific linguistic needs of the participants?
Yes [ ] No [ ] Unclear [ ]   10% [ ]

HINT: *Consider all or any of the following:*
- ✓ *Is the intervention delivered in participants' first or second language by healthcare workers or expert patients?*
- ✓ *Is the intervention delivered via an interpreter or translator?*
- ✓ *Is the intervention delivered with the aid of translated audio-visual aids for participants who speak or understand little of the service providers'' first language?*

Detailed Questions

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3. Do the service providers demonstrate cultural awareness?

Yes [ ] No [ ] Unclear [ ]   **10% [ ]**

HINT: *Consider the following:*
- ✓ *Do they demonstrate self awareness of their own personal and professional cultural biases so as to understand how they influence their interactions with patients and other clients?*
- ✓ *Are they sufficiently aware of their own cultural values, cultural identities, and traditional health and belief practices to assess the influence of culture on a patient's or client's health beliefs and interpret the patient's explanatory model of their illness based on their cultural backgrounds (**Shiu-Thornton, 2003**)?*
- ✓ *Are they sufficiently aware of cultural diversity to deal with ethnocentricity?*

4. Do the service providers have cultural knowledge?
    Yes [ ] No [ ] Unclear [ ]   **10% [ ]**

HINT: *Consider the following*
- ✓ *Do they have knowledge of cultures other than their own to understand the diversified needs of patients or clients?*
- ✓ *Do they value cultural diversity and the need to treat patients or clients as individuals?*
- ✓ *Do they demonstrate an acknowledgement of stereotypes, health inequalities, health beliefs and behaviours?*
- ✓ *Do they have clinical, cultural and humanistic knowledge to understand and collect relevant data on patients or clients, and undertake individual culturally-based physical assessments of patients or clients?*

5. Do the service providers have specialist knowledge in the clinical condition?
Yes [ ] No [ ] Unclear [ ]   **10% [ ]**

HINT: *Consider the following*
- ✓ *Do they have a sound scientific knowledge in the clinical condition under investigation?*
- ✓ *Have they undertaken relevant training to be competent in the delivering of the intervention?*
- ✓ *Can they use clinical and evidence-based knowledge to develop, assess, deliver, implement and evaluate individualised patient and client care?*

6. Are the linguistic needs of patients or clients met by:

     (a) Health workers speaking the patient's/client's main language?
       Yes [ ] No [ ] Unclear [ ]   10% [ ]
     (b) Health workers speaking the patient's/client's second language?
       Yes [ ] No [ ]   Unclear [ ]   7% [ ]
     (c) Interpreters (verbally/oral)? Yes [ ] No [ ] Unclear [ ]   5% [ ]
     (d) Translators (written material)? Yes [ ] No [ ] Unclear [ ]   5% [ ]
     (e) Audio–visual recorded aids? Yes [ ] No [ ] Unclear [ ]   3% [ ]

HINT: *Consider all the appropriateness of media used to communicate with the patients or clients.* Please choose only one answer most appropriate.

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7. Are the health literacy needs of patients and/or clients met by the delivery health workers or expert patients (patients with full knowledge of the clinical condition)?
Yes [ ] No [ ] Unclear [ ]   **10% [ ]**

HINT: *Consider the following*
- ✓ *Are they communicating at the appropriate level of the patients or clients?*
- ✓ *Is the scientific and/or health information understood by the patients or clients?*
- ✓ *Is the comprehension of the topic by patients/clients being assessed?*

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8. Are the service providers culturally-competent in the delivering of the intervention?
Yes [ ] No [ ] Unclear [ ]   **10% [ ]**

HINT: *Consider the following:*
- ✓ *Do they have self cultural awareness (please see #3 above)?*
- ✓ *Are they using clinical, assessment, and/or diagnostic skills appropriately?*
- ✓ *Are they taking into consideration the patient's/client's cultural beliefs, behaviours and care needs and addressing them where appropriate?*
- ✓ *Are they addressing cultural differences of patients/clients?*

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9. Are the service providers culturally sensitive?
Yes [ ] No [ ] Unclear [ ]   **10% [ ]**

HINT: *Consider the following:*
- ✓ *Do they deliver care services and treatment in a non-judgmental manner?*
- ✓ *Do they show empathy in delivering care services to patients or clients?*
- ✓ *Do they consider patients or clients as true partners in their own care and involve them in decision-making?*
- ✓ *Do they have appropriate interpersonal relationships with patients and clients?*
- ✓ *Do they use effective communication skills to facilitate and negotiate the care needs of patients or clients?*

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10. Does the intervention work? Yes [ ] No [ ] Unclear [ ]   **10% [ ]**
HINT: Consider at least two of the following:
- ✓ Does the intervention improve the quality of life (from primary and/or extrapolated evidence from secondary sources?
- ✓ Is the intervention cost effective when compared to standard care procedures?
- ✓ Is there evidence of objective and subjective intervention outcomes reported by users and service providers (e.g. satisfaction with care, improvements in laboratory parameters, improvement in knowledge of the clinical condition)?

Total: **100%**

Table 3: Included studies

Study references (first author & year)	Country / setting	Population	IN	CN	Com	Design	Mode & duration of intervention	Mode & duration of control	Delivery staff	Follow–up	Impact of intervention on outcomes
Greenhalgh et al (2011) [27]	UK Primary & secondary	South Asians & African – Caribbean	79	78	-	RCT with in-depth process evaluation	Unstructured group sessions in groups of 10-12 participants with sessions lasting for 2 hours held every fortnightly over 6 months	Usual care + structured standard diabetes education sessions in un-segregated by ethnicity groups led by a nurse & supported by an interpreter, if necessary	Trained Bilingual health advocates (BHAs) in story-sharing models using an accredited curriculum over 12 weeks	12 months	HbA1C, p=0.364 Total Cholesterol ratio / HDL, P=0.783 SBP, P=0.123 Total wellbeing, p=0.512 Patient Enablement Instrument (secondary outcome), p=0.002 Overall, no significant differences between intervention and control groups in biomedical outcomes, although attendance was 79% in intervention and 35% in control arms (p<0.0001)
Joshi et al (2010) [26]	USA Community & OPD clinics	Hispanics & African American	234 (110 African Americans (AA) &124 Hispanics)	100 (50 each)	-	RCT	4 group classes or one-to-one culture-specific education sessions with diabetes educators from the same ethnic backgrounds as participants including 2 weekly telephone follow-ups	Standard care (visit with a physician every 3 - 6 months)	2 trained nurse educators & 2 diabetic patients (1from each group) who had completed a standardised chronic disease management training programme	2 years	HbA1C} AA - p<0.001 Hispanics - p=0.004 Lipids} AA - P=0.064 Hispanics-P=0.003 Microalbuminuria} AA - p=0.85 Hispanics - p=0.85 ED visits} AA-p<0.001 Hispanics - p=0.001 Hospitalisation} AA - p=0.010 Hispanics - p=0.845 BP} AA - I Hispanics – ND Eye checks} AA - I Hispanics - NR Weight} AA - I Hispanics - I
Bellary et al (2008) [25]	UK Primary care	South Asians	868	618	-	RCT	Culturally sensitive enhanced individual care package with 4	Standard routine care (using the	Led by PN with support from 5 trained	2 years	MAP – p=0.018 Systolic BP – p=0.76 Diastolic BP – p=0.0001

Author	Setting	Ethnic group	Int.	Cont.	Other	Study design	Intervention	Control	Delivered by	Duration	Outcomes
							hours per week of additional nurses' resources & prescribing algorithm	same treatment protocols as intervention group)	multilingual Asian link workers & DSN		Total cholesterol – p=0.37 HbA1C – p=0.11 CHD risk – p=0.97 Waist circumference – p=0.67 BMI - p<0.0001 Little financial impact – ICR of £28,933 per QALY gained / £30,000 per QALY
Baradaran et al (2006) [24]	UK Community & primary care	South Asians (Indians & Pakistanis)	59	59	27 whites	RCT	Group diabetes education of between 6 and 12 participants, having 3 sessions with each lasting 1-1.5 hours & completed within 3 months	Standard routine care	2 bilingual health educators (dietician & podiatrist)	6 months	Knowledge - p=0.27 Attitudes towards seriousness - p=0.76 Attitude towards complications – p=0.38 Practice - p=0.23
O'Hare et al (2004) [23]	UK Primary care	South Asians	180	181	-	RCT	Enhanced Individualised cultural sensitive care with additional nurses' resources per week & treatment algorithm	Standard routine care (using same treatment protocols as intervention group)	Led by PN with support from 2 multilingual Asian link workers & Community DSN	1 year	Systolic BP – p=0.035 Diastolic BP – p=0.003 Total cholesterol – p=0.005 HbA1C – p=0.866 Financial investment produced little improvement £365 / £264
Povlsen et al (2005) [5]	Denmark Community	7 EMGs – 65% Muslims	37 families	N/A	-	Action research	Development of an adapted & translated educational material and guidelines for HCPs; subsequent re-education of children with T1DM and their families in 7 groups of 4 - 6 or 1-1 based on age & ethnicity of the children. Sessions given in their parent's native language or Danish	N/A	Led by experienced nurse in diabetes care, immigration & Muslim customs and supported by interpreters and clinical dieticians	6 months	Educational material topic received with enthusiasm. HbA1C – p=0.01 but increased after follow-up. Educational material & strategies – I Group attitude varied with some liking group participation & others not. Knowledge of diabetes management – I That is, diabetes education improved diabetes knowledge level and led to short term health benefits

Study	Setting	Population	Sample			Design	Intervention		Provider	Duration	Findings
Greenhalgh et al (2005) [28]	UK Community	Bangladeshis	42	N/A		Action research using narrative methods	Diabetes support & education groups led by BHAs using 'story-telling' format in partnership with clinicians, managers and service users. 10 formal programmes consisting of 3 hours sessions undertaken over 12 weeks	N/A	Bilingual health advocates (BHAs) & researchers	18 months	Development of an intervention for diabetes education aimed to engage trained BHAs to facilitate narratives or story-telling approaches as part of a programme to improve diabetes management for neglected Bangladeshi population. A user group led by BHAs successfully implemented though not in all cases. Glucose concentrations of 'active participants' improved
Mehler et al (2004) [30]	USA Community & OPD	Russians	55 (32 females & 23 males)	N/A	-	Retrospective cohort	Individualised care to assess outcomes pre / post arrival of a bilingual Russian internist. Cohort had between 1 and 6 internal medication clinic visits annually	N/A	Trained bilingual Russian internist in language & culture concordance	1-6 clinics reviews per year	HbA1C – p=0.007 Lipid (LDL) – p=0.0002 Systolic Bp – p=0.3 Diastolic BP – p=0.0002
Hoppichler et al (2001) [29]	Austria OPD	Mediterranean Turkish (MT) & Caucasian Austrian (CA) women with gestational diabetes	39 MT	N/A	72 CA	Retrospective cohort	Individualised weekly gestational diabetes counselling including dietary advice on food intake, insulin administration and techniques, signs and symptoms of hypoglycaemia and control procedures. Therapeutic regimen including dietary recommendations and insulin therapy instructions adapted to Turkish eating habits.	N/A	Led by a Dietician & Nurse educator and supported by trained translators	Not clear	31% Turkish women (not picked up at initial visit) found to be illiterates during intervention and a personalised education approach adopted with them. No significant differences in the clinical outcomes (family history of DM, HbA1C, weight& etc) except with eating habits as MT reported high intake of fat and carbohydrates, preferred female HCPs and adherent to religious beliefs. Cultural appropriate care leading to similar clinical outcomes

Utz et al (2008) [31]	USA Community	African Americans	22 (18 female & 4 male)	N/A	-	Quasi-experimental	Culturally tailored Group versus Individual DSME intervention to compare the impact and effectiveness on outcomes of self management & HbA1C control of participants with T2DM of 2 hours weekly over 8 weeks. Each participant paid $75 and other small gifts periodically	N/A	Led by 2 certified diabetes educators from the same ethnic backgrounds	10 weeks	HbA1C, self care actions, Self-efficacy level, goal attainment, and satisfaction with DSME. HbA1C, self care activities and goal attainment improved slightly in both groups over follow-up. Statistical trends indicated improved scores on dietary actions, foot care, goal attainment, and empowerment in the Group DSME, but differences not statistically significant
Wilson et al (1993) [32]	UK OPD	Asians	165 (96 male & 69 female)	N/A	-	Qualitative group discussion / interview	Implementing a diabetes group education program (one off 2.5 hours session in groups of 10 – 12 over 2 years) that promotes improvements in understanding and self management for Asians with diabetes	N/A	Led by Asian link worker trained in diabetes & supported by Diabetes Specialist Health Visitor	1 off session	Diabetes education programme for Asians was successful as it was tailored to their linguistic and cultural needs and improved their diabetes care. 2 initial recruitments were poor and improved by Asian link worker making individual home visits. Public awareness of diabetes in the community improved by providing health education in social venues such as temple.

Legend

AAs (African-Americans), BMI (body mass index), CHD (coronary heart disease), CN (number of participants in the control arm), Com (comparison), DSME (diabetes self management education), ED (emergency department), HbA1C (glycated haemoglobin), HDL (high-density lipoprotein), I (improvement), ICR (Incremental cost-effectiveness ratio), IN (number of participants in the intervention arm), LDL (low-density lipoprotein), MAP (main atrial pressure), ND (no difference), NR (not reported), PN (practice nurse)

Table 4: Quality assessment for the experimental studies [RCTs + quasi experimental studies [Adapted from Moher et al (2010)] [20]

Study References						Quality assessment criteria							
	1	2 (a+b)	3	4	5	6	7	8	9	10	11	12 (a+b+c)	%
Greenhalgh et al (2011)	Yes	Yes/No	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes / Yes / Yes	87% (A)
Joshi et al (2010)	Yes	No / No	Yes	No	No	No	Yes	No	Yes	Can't tell	Yes	Yes / Yes / Yes	53% (B)
Bellary et al (2008)	Yes	No / Can't tell	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes / Yes / Yes	80% (A)
Baradaran et al (2006)	Yes	No / Can't tell	Yes	No	Yes	No	Yes	No	Yes	Can't tell	Yes	Yes / Yes / Yes	60% (B)
O'Hare et al (2004)	Yes	No / Can't tell	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes / Yes / Yes	80% (A)
Utz et al (2008)	Yes	No / No	Yes	No	No	No	Yes	No	Yes	No	Yes	Yes / Yes / Yes	53% (B)

	Questions relating to the quality criteria for assessment of the above Experimental studies [Adapted from Moher et al (2010)] [20]
1	Is the study described as randomised and was the method appropriate?
2	a) Were participants adequately blinded? b) Was outcome assessment adequately blind?
3	Is there a description of withdrawals and dropouts and is this adequate?
4	Is allocation concealment described and was the method appropriate?
5	Is the flow of participants through each stage represented in a consort style diagram?
6	Did at least 80% of the number randomised provide data at the follow up of interest?
7	Are clearly defined primary/secondary outcomes given?
8	Is there a calculation to determine the sample size described and was the method appropriate?
9	Is there a comparison of groups at baseline on demographic/clinical characteristics that may influence the effectiveness of the intervention, including outcome measures?
10	Is an explicit ITT analysis described?
11	Is an adequate summary of results for each outcome provided, including for non-significant results?
12	a) Is the sample explicitly defined? b) Is the method of recruitment adequately described? c) Are precise details of the intervention/conditions for each group provided?

NOTE: Each of the 15 criteria above answers 'yes' or 'no' or 'can't tell' and score at least 8/15 (53%) in order for the study to be included
Scoring classification of the quality of included experimental studies
- Good quality studies must answer 'yes' to 80%-100% of the quality assessment criteria and scored as 'A'
- Moderate quality studies must answer 'yes' to 50%-79% of the quality assessment criteria and scored as 'B'
- Weak quality studies must answer 'yes' to less than 50% of the quality assessment criteria and scored as 'C'

Table 5 Online: Quality assessment for included qualitative and action research studies (Popay et al., 1998) [21]

Study References	Quality assessment criteria						%
	1	**2**	**3**	**4**	**5**	**6**	**%**
Greenhalgh et al (2005)- AR	Yes	Can't tell	Yes	Yes	Yes	Can't tell	67% (B)
Povlsen et al (2005) – AR	Yes	Yes	Yes	Yes	Yes	No	83% (A)
Wilson et al (1993) – QR	Yes	Yes	No	Yes	Yes	No	67% (B)

	Questions relating to the quality criteria for assessment of qualitative research [21]
1	A primary marker: Is the research aiming to explore the subjective meanings that people give to particular experiences of interventions?
2	Context sensitive: Has the research been designed in such a way as to enable it to be sensitive / flexible to changes occurring during the study?
3	Sampling strategy: Has the study sample been selected in a purposeful way shaped by theory and/or attention to the diverse contexts and meanings that the study is aiming to explore?
4	Data quality: Are different sources of knowledge / understanding about issues being explored compared?
5	Theoretical adequacy: Do the researchers make explicit the process by which they move from data to interpretation?
6	Generalisability: If claims are made to generalisability, do these follow logically and / or theoretically from the data?

NOTE: Each of the 6 criteria above answers 'yes' or 'no' or 'can't tell' and score at least 3/6 (50%) in order for the study to be included

Scoring classification of the quality of the included studies
- Good quality studies must answer 'yes' to 80%-100% of the quality assessment criteria and scored as 'A'
- Moderate quality studies must answer 'yes' to 50%-79% of the quality assessment criteria and scored as 'B'
- Weak quality studies must answer 'yes' to less than 50% of the quality assessment criteria and scored as 'C'

Coders from the table: AR for action research and QR for qualitative research

Table 6 Online: Quality assessment for included retrospective cohort studies (Critical Appraisal Skills Programme (2006) [22])

Study References	Quality assessment criteria												
	1	2	3	4	5	6	7	8	9	10	11	12	%
Mehler et al (2004)	Yes	Yes	Yes	Yes	Yes	Can't tell	Can't tell	Yes	Yes	Yes	Yes	Yes	83% (A)
Hoppichler et al (2001)	Yes	Yes	Yes	No	Yes	Can't tell	Can't tell	Yes	Yes	No	Can't tell	Can't tell	50% (B)

	Questions relating to the quality criteria for assessment of the above cohort studies [22]
1	Did the study address a clearly focused issue?
2	Did the authors use an appropriate method to answer their question?
3	Was the cohort recruited in an acceptable way?
4	Was the exposure accurately measured to minimize bias?
5	Was the outcome accurately measured to minimize bias?
6	Have the authors identified all important confounding factors and/or have they taken account of the confounding factors in the design and/or analysis?
7	Was the follow up of subjects complete enough and/or was the follow up of subjects long enough?
8	What are the results of this study?
9	How precise are the results and/or how precise is the estimate of the risk?
10	Do you believe the results?
11	Can the results be applied to the local population?
12	Do the results of this study fit with other available evidence?

NOTE: Each of the 12 criteria above answers 'yes' or 'no' or 'can't tell' and score at least 6/12 (50%) in order for the study to be included

Scoring classification of the quality of the included studies
Good quality studies must answer 'yes' to 80%-100% of the quality assessment criteria and scored as 'A'
Moderate quality studies must answer 'yes' to 50%-79% of the quality assessment criteria and scored as 'B'
Weak quality studies must answer 'yes' to less than 50% of the quality assessment criteria and scored as 'C'

Table 7 Online: Culturally-competent assessment of included studies based on a novel devised tool titled: Culturally-Competent Assessment Tool (CCAT) for Healthcare Interventions in Ethnic Minority Groups by these research authors

Culturally Competent Factors											
Study References	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**%**
Greenhalgh et al (2011)	Yes	Yes	Yes	Yes	No	Yes (a)	Yes	Yes	Yes	Yes	90% (A)
Joshi et al (2010)	Yes	Yes	Yes	Yes	Yes	Yes (a)	Yes	Yes	Yes	Yes	100% (A)
Bellary et al (2008)	Yes	Yes	Yes	Yes	Yes	Yes (c)	Unclear	Yes	Yes	Yes	85% (B)
Baradaran et al (2006)	Yes	Yes	Yes	Yes	Yes	Yes (a)	Yes	Yes	Yes	Yes	100% (A)
O'Hare et al (2004)	Yes	Yes	Yes	Yes	Yes	Yes (c)	Unclear	Yes	Yes	Yes	85% (B)
Utz et al (2008)	Yes	Yes	Yes	Yes	Yes	Yes (a)	Yes	Yes	Yes	Yes	100% (A)
Greenhalgh et al (2005)	Yes	Yes	Yes	Yes	Yes	Yes (a)	Unclear	Yes	Yes	Yes	90% (A)
Povlsen et al (2005)	Yes	Yes	Yes	Yes	Yes	Yes (c)	Unclear	Yes	Yes	Yes	85% (B)
Mehler et al (2004)	Yes	Yes	Yes	Yes	Yes	Yes (a)	Yes	Yes	Yes	Yes	100% (A)
Hoppichler et al (2001)	Yes	Yes	Yes	Yes	Yes	Yes (d)	Unclear	Yes	Yes	Yes	85% (B)
Wilson et al (1993)	Yes	Yes	Yes	Yes	Yes	Yes (a)	Yes	Yes	Yes	Yes	100% (A)

Culturally-Competent Assessment Tool for Healthcare Interventions in Ethnic Minority Groups by this research authors

	Assessment Factors for Culturally-Competent Care Interventions
1	Does the intervention have a clear focus on ethnic minority groups?
2	Is the intervention sensitive to the specific linguistic needs of the participants?
3	Do the service providers demonstrate cultural awareness?
4	Do the service providers have cultural knowledge?
5	Do the service providers have specialist knowledge in the clinical condition?
6	Are the linguistic needs of patients or clients met by (a) health workers speaking the patient's/client's main language (b) Health workers speaking the patient's/client's second language? (c) interpreters? (d) translators? (e) Audio–visual recorded aids?
7	Are the health literacy needs of patients and/or clients met by the delivery health workers or expert patients?
8	Are the service providers culturally-competent in the delivering of the intervention?
9	Are the service providers culturally sensitive?
10	Does the intervention work?

NOTE: For an intervention to be culturally-competent, the answer is 'yes' to number 1 and 2 and at least 6 other questions in 3-10 scoring above (70%)

Scoring classification of the quality of the culturally-competent intervention
- Highly culturally-competent must answer 'yes' to 90%-100% of the assessment factors or criteria and scored as 'A'
- Moderately culturally-competent intervention must answer 'yes' to at least 70%-89% (B)
- Low culturally-competent intervention scores less than 70% (C).