Evidence Summary Title:
Culturally appropriate health education for type 2 diabetes mellitus in ethnic minority groups: Evidence and implications for public health

Review Quality Rating: 10 (strong)

Review on which this evidence summary is based:

Review author contact information:
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This is an evidence summary written to condense the work of the authors of this systematic review, referenced above. The intent of this summary is to provide an overview of the findings and implications of the full review. For more information on individual studies included in the review, please see the review itself.

Note: The Cochrane review that this evidence summary is based on has been updated. This evidence summary summarizes the above-cited version of this review, not the updated version. An updated evidence summary will be provided as soon as possible.

Review content summary
This is a systematic review of 11 randomized controlled trials (RCTs) (1603 participants), with ten trials providing suitable data for a meta-analysis. This review aimed to determine the effectiveness of culturally appropriate diabetes health education on outcome measures in type 2 diabetes. Participants studied were: 16 years of age and older, with type 2 diabetes of any duration of diagnosis, with or without complications of diabetes, and ethnic minority residents in upper-middle and high-income countries. Interventions were culturally appropriate diabetes health education and included: dietary advice, health lifestyle information on smoking, exercise, weight reduction, information on the use of screening services, foot care, and monitoring of blood sugars and blood pressure. Outcomes measured included: glycaemic control as measured by glycosylated haemoglobin (HbA1c levels), blood pressure (BP), and validated quality of life measures. Participants in control groups received “usual care” which varied across studies. Other potentially important secondary outcomes were examined: body mass index (BMI), lipid levels (total cholesterol, high density lipoprotein levels [HDL], low density lipoprotein levels [LDL]), main long-term complications of diabetes, mortality rates attributable to diabetes, acute hospital admissions, hypo- and hyperglycaemic episodes, and a variety of patient oriented measures (e.g., attitude, and satisfaction). Authors report that culturally appropriate diabetes health education appears to have small to moderate short-term effects on glycaemic control, total cholesterol, and knowledge of diabetes. No data were available on the long term impact of the intervention.

Comments on this review's methodology
This is a methodologically strong systematic review. A focused clinical question was clearly identified. Appropriate inclusion criteria were used to guide the search. A comprehensive search was employed using health, psychological, and educational databases; reviewing reference lists of primary studies; handsearching relevant journals; and contacting key informants. The search was not limited by language. Primary studies were assessed for methodological quality based on the following criteria: research design, sources of bias, follow-up/attrition rates and data analysis. The methods were described in sufficient detail to allow replication and two reviewers were involved in quality appraisal. Any discrepancies in appraisal results were rectified by discussion. The results of this review were transparent. Results were clearly presented with forest plots so as to allow for comparisons across studies. Heterogeneity was assessed. Appropriate analytical methods (fixed and random effects) were employed to enable the synthesis of study results.

Why this issue is of interest to public health
Type 2 diabetes is a significant public health problem in Canada. Excess blood glucose levels can lead to the dysfunction of organs, such as the kidneys, eyes, nerves, heart and blood vessels, which may result in death. Type 2 diabetes represents about 90-95% of the total diabetic population. In Canada, approximately 2 million Canadians aged 1 and older (1 in 16 people) are living with diabetes. Projections indicate that by 2012 almost 2.8 million Canadians will be living with diabetes – an estimated annual percent increase of about 6% per year with an overall increase of about 25% from 2007. The risk of type 2 diabetes increases with age, obesity, and physical inactivity. In higher income countries minority ethnic groups often suffer a higher prevalence of type 2 diabetes compared to the local population. A systematic review found that minority populations present 2 to 6 times the risk of diabetes compared to the predominant Caucasian population. Minority groups tend to have low socio-economic backgrounds, and cultural and communication barriers which may impact access to health care. Health education interventions have been shown to be effective in improving outcomes among ethnic minorities with diabetes.
### Evidence and Implications

Evidence points are not in order of the strength of evidence.

<table>
<thead>
<tr>
<th>What's the evidence?</th>
<th>Implications for practice and policy:</th>
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</thead>
<tbody>
<tr>
<td><strong>1. Primary biomedical measures</strong></td>
<td><strong>1. Primary biomedical measures</strong></td>
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<tr>
<td>1. Glycaemic control (10 studies)</td>
<td>1.1. Practitioners should provide culturally appropriate diabetes health education to achieve a small effect on improving glycaemic control among minority populations in the short-term.</td>
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<tr>
<td>1.1. <strong>Up to 3 months follow-up</strong> (5 studies)</td>
<td>1.2. Practitioners should explore strategies to sustain long term effectiveness on glycaemic control.</td>
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<tr>
<td>- Participants receiving culturally appropriate diabetes health education experienced a statistically significant moderate improvement in glycaemic control as compared to controls. The true effect ranged from a small to moderate improvement (WMD -0.32, 95% CI -0.63 to -0.01).</td>
<td>1.3. Since providing culturally appropriate diabetes health education does not appear to improve blood pressure levels among minority populations, diabetes practitioners should explore other methods to improve blood pressure with this population.</td>
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<tr>
<td>1.1.2. <strong>Up to 6 months follow-up</strong> (6 studies)</td>
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<tr>
<td>- Participants receiving culturally appropriate diabetes health education experienced a statistically significant moderate improvement in glycaemic control as compared to controls. The true effect ranged from a moderate to large improvement (WMD -0.60, 95% CI -0.85 to -0.35).</td>
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<td>1.1.3. <strong>Up to one year follow-up</strong> (3 studies)</td>
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<tr>
<td>- Culturally appropriate diabetes health education had no impact on participants' improved glycaemic control as compared to controls (WMD -0.1, 95% CI -0.4 to 0.2).</td>
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<td><strong>1.2. Blood Pressure (BP) (4 studies)</strong></td>
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<tr>
<td>1.2.1 <strong>Systolic BP</strong></td>
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<tr>
<td>1.2.1.1 <strong>Up to 3 months follow-up</strong> (3 studies)</td>
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<tr>
<td>- Culturally appropriate diabetes health education had no impact on participant's systolic BP in comparison to controls (WMD 2.38, 95% CI -2.34 to 7.09)</td>
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<tr>
<td>1.2.1.2 <strong>Up to 6 months follow-up</strong> (2 studies)</td>
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<tr>
<td>- Culturally appropriate diabetes health education had no impact on participant's systolic BP in comparison to controls (WMD -0.65, 95% CI -9.25 to 7.94)</td>
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<td>1.2.1.3 <strong>Up to one year follow-up</strong> (1 study)</td>
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<td>- Participants who received culturally appropriate diabetes health education negatively experienced increased systolic BP as compared to controls (MD 4.58 mmHg, 95% CI 0.36 to 8.80).</td>
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<tr>
<td>1.2.2 <strong>Diastolic BP</strong></td>
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<tr>
<td>1.2.2.1 <strong>Up to 3 months follow-up</strong> (3 studies)</td>
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<tr>
<td>- Culturally appropriate diabetes health education had no impact on participant's diastolic BP in comparison to controls (WMD 0.07, 95% CI -2.59 to 2.72)</td>
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<tr>
<td>1.2.2.2 <strong>Up to 6 months follow-up</strong> (2 studies)</td>
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<tr>
<td>- Culturally appropriate diabetes health education had no impact on participant's diastolic BP in comparison to controls (MD -1.00 mmHg, 95% CI -6.07 to 4.07; &amp; MD -1.47 mmHg, 95% CI -14.96 to 12.02)</td>
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<td>1.2.2.3 <strong>Up to one year follow-up</strong> (1 study)</td>
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<tr>
<td>- Participants who received culturally appropriate diabetes health education negatively experienced increased diastolic BP as compared to controls (MD 2.86 mmHg, 95% CI 0.74 to 4.98).</td>
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<tr>
<td><strong>2. Primary patient oriented measures</strong></td>
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<td>2.1. Quality of life (3 studies)</td>
<td>2.1. Culturally appropriate diabetes health education is not</td>
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</table>
2.1.1. Culturally appropriate diabetes health education had no impact on improving participants' quality of life measures in comparison to controls up to 6 months follow-up (WMD -0.04, 95% CI -0.37 to 0.29).

3. Secondary biomedical measures

3.1. Body Mass Index (BMI) (3 studies)
3.1.1. Culturally appropriate diabetes health education had no impact on improving participants' BMI in comparison to controls up to 3 and 6 months follow-up (WMD at 3 months -0.68, 95% CI -1.92 to 0.55; WMD at 6 months -0.67, 95% CI -1.72 to 0.38).

3.2. Lipid levels
3.2.1. Up to 3 and 6 months follow-up
Culturally appropriate diabetes health education had no impact on reducing total cholesterol, high density lipoprotein low density lipoprotein and triglycerides, in comparison to controls.

3.2.2. Up to one year follow-up (3 studies)
Participants receiving culturally appropriate diabetes health education experienced statistically significant moderate reductions in total cholesterol only as compared to controls. The true effect ranged from a small to moderate reduction (WMD -0.39, 95% CI -0.64 to -0.14).

3.3. No studies evaluated impact on: long term complications, mortality related to diabetes, acute hospital admissions, hypo and hyperglycaemic episodes.

3. Secondary patient oriented measures

4.1. Knowledge scores (7 studies)
4.1.1. Up to 3 months follow-up (4 studies)
Participants receiving culturally appropriate diabetes health education experienced moderate improvements in diabetes knowledge as compared to controls. The effect on knowledge scores was moderate (0.6) and ranged from 0.4-0.7 (SMD 0.6, 95% CI 0.4 to 0.7).

4.1.2. Up to 6 months follow-up (5 studies)
Participants receiving culturally appropriate diabetes health education experienced moderate improvements in diabetes knowledge as compared to controls. The effect on knowledge score was moderate (0.5) and ranged from small to moderate 0.3 - 0.7 (SMD 0.5, 95% CI 0.3 to 0.7).

4.1.3. Up to one year follow-up (2 studies)
Participants who received culturally appropriate diabetes health education experienced moderate improvements in diabetes knowledge as compared to controls. The true increase in knowledge scores ranged from small to moderate increases (SMD 0.4, 95% CI 0.1 to 0.6).

4.2. Attitude scores (2 studies)
4.2.1. Culturally appropriate diabetes health education had no impact on improving attitude scores or patient self efficacy and empowerment.

4. Secondary patient oriented measures

4.1. Practitioners should provide culturally appropriate diabetes health education to achieve small to moderate improvements in knowledge about diabetes among minority populations up to one year after the intervention.

5. Methodological Issues with the Primary Studies in the Review

5.1. Randomization process not described
5.2. Allocation concealment not described
5.3. Baseline differences detected between groups
5.4. No power calculation
5.5. Intention-to-treat analysis not conducted
5.6. Risk for contamination bias
5.7. Inadequate follow-up duration
5.8. Studies did not measure dose of intervention
5.9. Studies did not measure reinforcement of intervention

5. Implications for Future Research

5.1. Future research should involve:
5.1.1. Appropriate and clear randomization and allocation procedures;
5.1.2. Effective recruitment and retention strategies;
5.1.3. Valid and reliable diabetes outcome measures;
5.1.4. Inclusion of minority populations; and
5.1.5. Cost-effectiveness of interventions

5.2. Researchers should investigate:
5.2.1. The effective dose of health education to achieve short and long term effects; and
5.2.2. The need for and timing of reinforcement education (e.g. boosters) to maintain significant effects in the community.
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2. The sustained (long-term) benefits of providing culturally appropriate health education require further research.

Future research should use high-quality rigorous methodologies to explore specific aspects of culturally appropriate health education that contribute to the effectiveness of the intervention.

**Legend:** CI – Confidence Interval; OR – Odds Ratio; RR – Relative Risk; WMD – weighted mean difference; SMD – standard mean difference; MD – Mean difference

**For definitions see the healthevidence.org glossary [http://www.healthevidence.org/glossary.aspx](http://www.healthevidence.org/glossary.aspx)**

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### References used to outline issue


### Other quality reviews on this topic


### Related links


### Suggested citation


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