Table 3. Effectiveness of the interventions to manage diabetes among migrants and ethnic minorities living in industrialized countries

Author, (Year), Country	Objective	Follow up	Outcome Measures Baseline	Outcome Measures at follow up	Difference/ conclusion
Lorig et al 2008, USA	Assess effectiveness of Spanish Diabetes Self-Management Program (SDSMP) on health status, health behaviors, and self-efficacy	6 and 18 months	HbA1c: Int. 7.44 (2.00); Cont: 7.38 (1.87) Insulin use: Int. 8.7% vs Cont. 12.1%	HbA1c Changed 6 months: Int.: 0.408 (1.42); Cont: 0.050 (1.57) Self-efficacy improved in int. group, compared to controls. No differences between groups in health behaviors, BMI, insulin use, or health care utilization At 18 mths: Int participants reduced mean HbA1c -0.319,	The SDSMP demonstrated effectiveness in lowering A1C and improving health status. Reinforcement of telephone calls did not add to its effectiveness
Thom et al., 2013, USA	Assess whether clinic-based peer health coaching, compared with usual care, improves glycaemic control for low-income patients who have poorly controlled diabetes	6 months	HbA1c %: 10.14 (2.01) vs 9.84 (1.95); LDC-C: 98.8 (34.2) vs 95.7 (35.8); BMI: 35.0 (8.3) vs 32.5 (8.5); SBP: 143.0 (23.9) vs 143.4(22.3) Hypertension: 88.5 vs 77.5%; Hypterlipidemia: 69.6 vs 68.2 Insulin use: 60.1% vs. 50.0%	6 mth follow up: HbA1c: 8.98 (2.0) vs 9.55 (2.3); LDL-C: 90.9 (27.8) vs 93.7 (37.4); SBP: 144.2 (20.1) vs 139.7 (24.1); BMI: 35.0 (8.2) vs 32.8 (8.6)	Peer health coaching improved diabetes control in adults of low-income primary care patients
Safford et al., 2013, USA	Assess effect of an innovative peer-coaching intervention plus brief education vs brief education alone on diabetes outcomes	10 months	HbA1c: 8.0 (2.1) vs 7.9 (1.9); BMI Int vs. Cont: 36.5 (7.7) vs. 36.0 (9.1), SBP: 134.6 (21.7) vs 135.8 (21.2); DM distress scores:2.1 (1.2) vs 2.1 (1.2) Insulin use: 39.9% vs 39.1%	Changes in outcomes: HbA1c: -0.004 (1.5) vs. 0.070 (1.3); BMI: 36.27 vs. 35.51; SBP: -0.41 (21.3) vs -1.88 (22.8); DM distress: -0.13 (1.2) vs -0.29 (1.1)	Telephone-delivered peer coaching held promise to improve health for individuals with diabetes living in under-resourced areas
Lujan et al., 2007, USA	Assess effectiveness of promotors (community lay workers) led intervention on T2 diabetes management	6 months	HbA1c: 8.21 (2.2) vs 7.71 (1.49); DM health belief measure scores: 56.4 (12.2) vs 57.0 (10.6)	HbA1c: 7.76 (1.87) vs 8.01(1.8); DM health belief measure scores: 54.6 (8.4) vs 50.8 (13.6)	Peer support intervention was effective in improving diabetes outcomes among Mexican Americans
Long et al., 2012, USA	Determine if peer mentors intervention is superior to usual care	3 weeks	HbA1c: Int. 9.8 (1.8) vs Cont. 9.9 (1.6); Self-reported adherence: 79% vs 67% Insulin use: 71% vs. 72%	HbA1c: 8.7% vs. 9.8%	Peer mentorship improved glucose control in a cohort of African American Veterans with diabetes.
Culica et al., 2008, USA	Determine effectiveness of community health worker for diabetes self-management compared to other programs	6 and 12 months follow up	HbA1c and SD: Full parti: 8.14 (1.65) vs Partial parti: 7.9, (2.00) BMI: 31.22 (5.99) vs 32.73 (6.59) DBP: 79.71 (8.79) vs 80.11 (10.23) SBP: 120.46 (11.9) vs 124.79 (12.26)	12 months: HbA1c: 7.00 (1.06) vs 7.45 (1.35) BMI: 31.12 (6.22) vs 32.52 (6.30) DBP: 76.64 (9.56) vs 75.88 (11.26) SBP: 122.09 (13.77) vs 122.94 (14.42)	The significant improvement in HbA1c observed in patients who completed one year of CoDE delivered by community health workers
Kangovi et al., 2017, USA	Determine effectiveness of CHW led intervention among people with multiple chronic conditions	6 months	Plus CHW vs goal setting only. HbA1c: 8.7 vs 9.0; BMI 40.2 vs 39; SBP: 139.6 vs 146.2	Plus CHW vs goal setting only. HbA1c: 8.3 vs 8.9; BMI: 40.2 vs 38.9; SBP: 139.6 vs 135	A standardized CHW intervention improved chronic disease control, mental health, quality of care, and hospitalizations among Acrican-

					Americans
Frosch et al., 2011, USA	Assess effectiveness of ongoing telephone support for patients with diabetes among socially and economically disadvantaged African-American and Latino patients	6 months	HbA1c: 9.4 (1.9) vs 9.8 (2.1); BMI: 33.3 (8.0) vs 32.8 (7.4); SBP: 127.6 (17.3) vs 127.7 (17.2)	HbA1c: 8.9 (0.19) [8.6-9.3] vs 9.2 (0.19) [8.8-9.6]; BMI: 33.4 (0.76) [31.9-34.9] vs 32.9 (0.76) [31.4-34.4]; SBP: 129.1 (1.9) [125.4-132.8] vs 128.2 (1.9) [124.5-131.9]; DBP: 74.3 (1.0) [72.3-76.3] vs 73.6 (1.0) [71.6-75.6]	No significant effect of the experimental intervention compared with the control condition. The dose of intervention provided was less than in previously published studies
Lima et al., 2017, Spain	Assess patient-practitioner communication compared to usual care in improving diabetes self-management	12 months	HbA1c: 8.89 (0.18) vs 8.93 (0.14); HDL 42.42 (2.37) vs 51.47 (3.38); LDL: 112.53 (6.36) vs 122.53 (7.90) SBP: 132.26 (2.98) vs 125.36 (4.37); DBP: 78.00 (1.42) vs 75.14 (2.84); BMI: 33.81 (0.85) vs 33.51 (1.40)	HbA1c: 8.19 (0.15) vs 8.28 (0.16); HDL 44.34 (1.52) vs 52.34 (2.68); LDL: 119.07 (5.45) vs 121.95 (4.58); BMI: 32.69 (2.94) vs 32.53 (1.46) SBP: 132.25 (2.47) vs 132.4 (2.09); DBP 77.72 (1.46) vs 78.72 (72.72)	A modest benefit in glycaemic control compared with usual care, although no effect was observed in secondary outcomes.
Tsimikas et al., 2011, USA	Assess effect of a culturally sensitive diabetes self-management education program using peer-educator format among Mexican-Americans	4 months	HbA1c (%): 10.5 (1.7) vs 10.3 (1.7); SBP: 123.9 (15.5) vs 121.2 (17.5); DBP: 74.8 (7.7) vs 75.1 (7.9); BMI 30.9 (6.3) vs 32.14 (5.9)	4 months FU: HbA1c: 9.0 (1.9) vs 9.1 (1.9); SBP: 119.6 (13.6) vs 121.7 (17.9); DBP: 73.1 (8.1) vs 74.7 (9.7); BMI: 30.6 (6.0) vs 32.3 (6.3) 10 months FU: HbA1c: 9.1 (2.0) vs 9.7 (2.3); SBP 118.9 (14.8) vs 119.3 (16.6); DBP: 71.8 (8.0) vs 74.8 (8.1); BMI 30.9 (6.0) vs 31.7 (6.4)	Culturally sensitive, peer-led education, demonstrated improvement in glucose and metabolic control indicating that this low-cost self-management education was effective
Keyserling et al., 2002, USA	Assess effectiveness of culturally appropriate clinic- and community-based intervention for African-American women with T2DM	6 and 12 months follow up	Mean PA (kcal/day): Group A, B C: 342; 336; 321 Mean BMI: 36.2; 34.6; 36.5 Mean HbA1c: 10.8; 11.1; 11.3 Mean total kcal/day 2,053; 2,041; 2,056 Insulin use: 43.3%; 40.9%; 41.8%	At 12 months: Mean PA (kcal/day): Group A, B C: 364; 322; 297 Mean HbA1c: 10.8; 10.9; 10.7	The intervention was associated with a modest enhancement of PA and was acceptable to participants.
Brown et al., 2002, USA	Determine effects of a culturally competent diabetes self-management intervention	6 and 12 months	HbA1c: Int. 11.81%, SD 3.00 vs. Con. 11.80% SD 3.02; Cholesterol: 211.83 vs. 203.57; BMI: 32.33 (5.97) vs. 32.12 (6.35). Insulin use: 20% vs 21%	At 12 months: HbA1c 10.89% SD 2.56 vs. 11.64%, SD 2.85; Cholesterol: 189.88 vs. 187.64; BMI 32.17 (6.45) vs. 32.28 (6.52)	Study confirmed effectiveness of culturally competent diabetes self-management education among Mexican Americans
Brown et al., 2005, USA	Compare two diabetes self-management interventions designed for Mexican Americans: “extended” (24 h of education, 28 h of support groups) and “compressed” (16 h of education, 6 h of support groups).	12 months	HbA1c: Compressed: 11.8 3.4 (114); Extended: 11.5 3.5 (102); Knowledge levels: 14.7 3.4 (114) vs. 14.9 3.2 (102); BMI: 32.2 (5.8) vs. 32.9 (8.3) Insulin use: 5.3% vs 6.3%	12 months: HbA1c: Compressed: 11.1 3.2 (96); Extended: 10.5 3.0 (89); Knowledge levels: 16.0 3.4 (97) vs. 16.4 3.0 (89)	Both culturally competent diabetes self-management education interventions were effective in promoting improved metabolic control and diabetes knowledge

O'Hare et al., 2004, UK	Determine effectiveness of enhanced care of diabetes to improve risk factors for diabetic vascular complications	12 months	HbA1c (%): 7.8 (1.9) vs 8.1 (2.1); SBP: 146.3 (21.7) vs 143.8 (21.7); DBP: 82.8 (10.8) vs 80.7 (11.3) Insulin use: Int. 17% vs. Cont. 21%	HbA1c (%): 7.57 (1.42) vs 7.9 (1.54); SBP: 139.6 (21.24) vs 141.7 (17.4); DBP: 79.7 (10.6) vs 80.4 (10.0)	Support from link worker and diabetes nurse along with treatment protocol would help improving diabetes self-management
Bellary et al., 2008, UK	Determine effectiveness of culturally sensitive enhanced care package to improve risk factors for diabetic vascular complications	24 months	HbA1c (%): 8.2 (1.9) vs 8.2 (1.8); SBP: 139.4 (21.1) vs 141.1 (20.3); DBP: 82.9 (11.0) vs 83.8 (11.1) Insulin use: Int. 19% vs. Cont. 21%	HbA1c (%): 8.1 vs 8.1; SBP: 138.0 vs 140.8; DBP: 80.6 (11.0) vs 81.9 (11.1)	Support from link worker and diabetes nurse along with treatment protocol would help improving diabetes self-management
Middelkoop et al., 2001, Netherlands	Assessing effectiveness of culturally appropriate intervention to improve HbA1c and lipid profiles.	6 months with 12 months follow up	HbA1c: 8.4% vs. 8.2%	Int. group reduced HbA1c level of 0.29% vs. moderate results in waiting list participants. HbA1c changes (Int. vs. Waiting list at 0.42%) Int. group decreased BMI by 0.04. After 1 year, the lipid profile improved; total cholesterol decreased by 0.56 mmol/l, total cholesterol–to–HDL ratio decreased by 0.54 mmol/l, and triglycerides decreased by 0.34 mmol/l.	Nursing staff play significant roles to improving HbA1c levels and other key outcome variables.
Islam et al., 2018, USA	Examine the efficacy of a CHW-led patient-centered lifestyle intervention on type 2 diabetes management among Bangladeshis in NYC, USA.	6 months follow up	HbA1C: Int. 7.7 (7.6–7.9) vs. Cont. 8.0 (7.8–8.2) Cholesterol: 159.1 (150.9–167.3) vs 155.1 (147.0–163.1) BMI: 26.9 (26.3–27.5) vs. 27.0 (26.3–27.6) PA (weekly): Int. 99.7 min vs. Cont. 176.9 min	Int. group reduced mean HA1C by 0.2% vs. no changes in control group Int. group reduced cholesterol level by 10.6 mg/dL vs. 0.6 mg/dL in control group Int. group reduced BMI by -0.4 vs control group –0.2 kg/m2	CHW-led culturally tailored intervention was effective in improving patient centred outcomes among Bangladeshi migrants with Type 2 diabetes

RCT: Randomized controlled trial; Int.: Intervention; Cont.: Control; DM: Diabetes mellitus; T2DM: Type 2 diabetes mellitus; PA: Physical activity; CHW: Community health worker; HbA1c: Hypoglycaeted haemoglobin; LDL: Low-density lipoproteins; HDL: High-density lipoproteins; SBP: Systolic blood pressure; DBP: Diastolic blood pressure; BMI: Body mass index