

Medical College of Wisconsin

The components and effectiveness of self-management interventions among adult type 2 diabetes patients in low-income countries: a systematic review

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INTRODUCTION

• Globally, over 537 million adults aged 20–79 years have diabetes, and the burden is predicted to rise to 783 million by 2045¹.

• In low-income countries (LICs), the prevalence of diabetes is projected to increase from 5.3%-54.9% by 2045², and there are significant gaps in care for chronic conditions³.

• This review focused on components and effectiveness of self-management (SM) interventions in controlling blood glucose levels among adult patients with Type 2 Diabetes (T2D) in LICs.

METHODS

Review process

• We followed Joanna Briggs Institute (JBI) methodology for systematic reviews of effectiveness for this review.

Inclusion criteria

•**Participants:** Adults (18+ years) living with T2D in LICs (World Bank Classification of 2023)⁴.

•**Interventions:** Aligned with 14 categories of the PRISMS taxonomy⁵.

•**Comparators:** Self-management interventions compared to other interventions or usual care.

•**Outcomes:** *Primary*–HbA1C, Fasting blood glucose; *Secondary*–weight, BMI, waist circumference, lipid profile.

•**Types of studies:** Able to provide up to fair evidence as per hierarchy of evidence for healthcare interventions⁵.

Approaches and tools (i)

•**Protocol registration:** PROSEPERO (CRD42024507800).

•**Search strategy:** Based on “Population”, “Intervention”, “Outcome” and “Study design” criteria⁶.

•**Study selection:** Used EndNote X8 to manage citations and Rayyan⁷ for blinded title/abstract screening by three reviewers.

•**Language and date:** Restricted to publications in English language published by December 21st, 2023.

•**Data extraction:** Two independent reviewers using JBI standardized data extraction tool⁸.

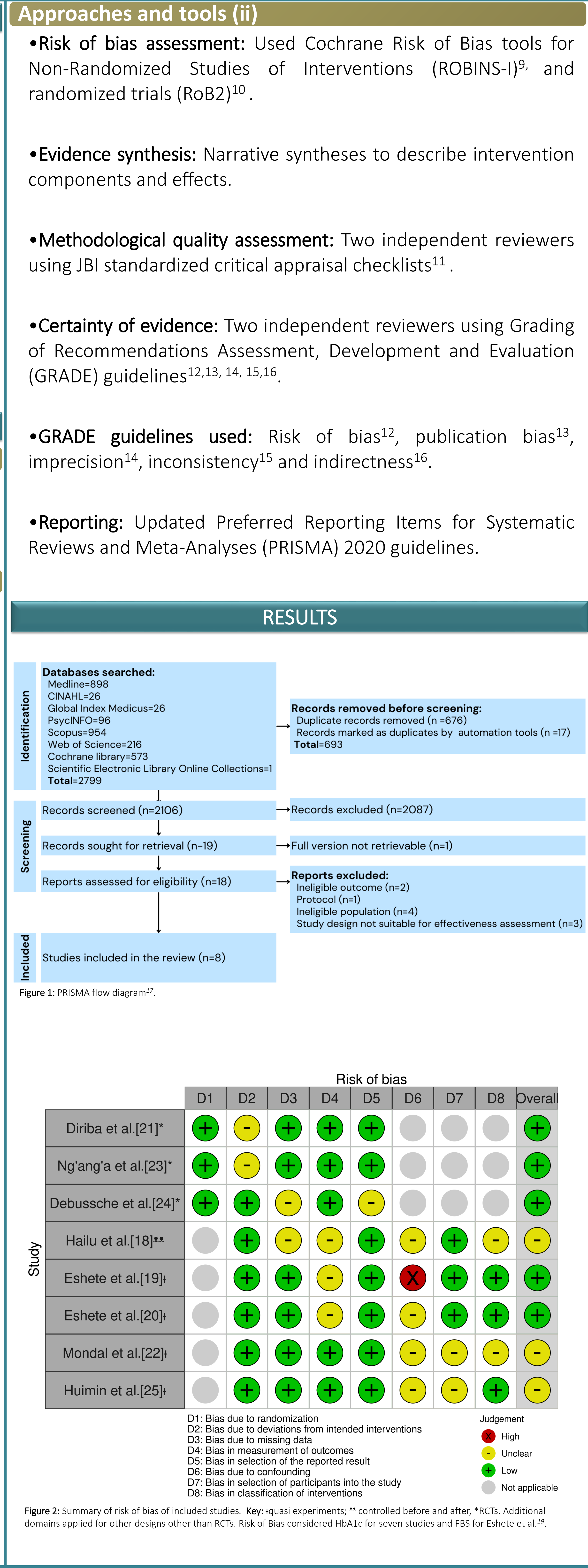


Table 1: Studies and intervention characteristics

Study ID	Participants		Intervention characteristics			Retention % (IG/CG)
	# IG/CG	Mean age IG/CG	Intervention description	Duration (Months)	Delivery	
18	116/104	55/54	Six 1.5hr monthly Nurse-led DSME	9	Group	67/64
19	108/108	NA	Nutritional promotion; 3 weekly educational sessions.	6	Mixed	98.15/97.2
20	108/108	NA	30–50 min education physical activity (PA) promotion.	6	Mixed	99.1/100
21	38/38	49.4	Culturally tailored, family-supported, community-based SM education and support.	2	Dyads	100
22	6/6/6/6	NA	3 groups; Aerobic Exercise (AE) & Resistance Exercise (RE) i.e., AE, RE and Combined AE & RE.	4	Group	100
23	42/38	51.0	Home-based self-monitoring of blood glucose kits & logbooks.	6	Group	90.5/92.1
24	76/75	52.5/53.9	3 courses community-based peer-led structured patient education.	12	Group	93.3/92.1
25	22/9/10	53 /55	Aerobic exercises training i.e., Low intensity (LEX), Vigorous intensity (VEX).	3	Group	100%

All interventions: used in-person communication except²³ were compared to usual care and high intensity programs except²⁵. Studies were done in Ethiopia^{18, 19, 20, 21, 22}, Rwanda²³, Mali²⁴ and Mozambique²⁵. Study designs were RCTs ^{21, 23, 24}, Quasi experiments^{19, 20, 22, 25} and Controlled Before and After¹⁸. IG=Intervention Group; CG=Control Group.

Table 2: Summary of effectiveness of interventions

Study ID	Outcome(s)	Intervention effect estimates SD		GRADE*
		Intervention (s)	Comparison	
18	HbA1c Fasting Blood Sugar (mg/dl) [†]	↓ 2.88% (4.28) ↓ 27 ± 10	↓ 2.57% NA	Low
19	Dietary adherence [‡] Fasting Blood Sugar (mg/dl) [†]	69.8% 24.5%	26.7% 15.2%	Very Low
20	PA (days and minutes/week) [‡] Fasting Blood Sugar (mg/dl) [†]	3.12 ± 0.65) 168.76 ± 49.57 mg/dl	2.51 ± 0.52 182.40 ± 42.91	Low
21	HbA1c	↓ 1.1% from 8.9% to 7.8%	↑ 0.6%	Low
22	HbA1c (%) [‡] FBS (mg/dl)	AEG/ REG/COM:-0.53/-0.58/-0.88 AEG/ REG/COM:-16.67/-19.83/-27	0.42±0.88 67±98.57	Very Low
23	HbA1c [‡]	↓ 0.94%	↑ 0.73%	Very Low
24	HbA1c Dietary practices	↓ 1.05 28.9%	↓ 0.15 28.0%	Low
25	HbA1c	Pre : 8.8 ± 0.5, Post 7.7 ± 0.4	Pre : 8.4 ± 0.9, Post 7.7 ± 0.8	Very Low

*Significant effect. *Risk of Bias considered HbA1c for the 7 studies and FBS for Eshete et al.¹⁹. PA=Physical Activity. AEG=Aerobic Exercise Group; REG=Resistance Exercise Group; COM=Combined AE & RE. SD=Standard Deviation.

Discussion

•Most of the interventions that led to significant glycemic control were those delivered to individuals or individuals and family members compared to those which were either mixed or group based.

•Five studies^{19-21, 24, 23} had a low risk of bias overall and the rest ^{18, 22, 25} had concerns for bias.

•On methodological quality, RCTs scored 9-10 out of 13, other studies (quasi experiments and controlled before and after) scored 7-9 out of 9.

Conclusion and Recommendations

•Self-management interventions focused on behavior change were effective in improving glycemic control among adults with type 2 diabetes.

•The few studies found in this review indicates a big gap in evidence on self-management interventions in LICs despite increasing T2D burden.

•This underscores the need to strengthen the evidence base for diabetes self-management through more rigorous study designs given the increasing burden of diabetes in LICs.

•Future studies should also consider other patient-outcomes and longer follow-up periods to assess the sustainability of outcomes.

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