The Impact of Drug Therapy Management by Pharmacists on Glycemic Management in Patients with Diabetes: A Systematic Review

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BACKGROUND

Pharmacists (RPh) undergo holistic entry-level training in evidence-based medicine and social, behavioral, and communication aspects of patient care. The experience builds rapport to enable effective disease self-management education (DSME), counseling, and therapeutic decision-making to optimize care.

Collaborative drug therapy management (CDTM) is a voluntary agreement between RPh and providers that enables pharmacists to prescribe medications to facilitate timely therapeutic adjustments. The expectations of CDTM is to provide more efficient care and meaningfully improve diabetes outcomes.

OBJECTIVE

To evaluate the impact of RPh interventions via CDTM on glycemic control in diabetic patients.

METHODS

Pubmed, Embase, and CINAHL were searched through April 21, 2022, utilizing terms for "diabetes mellitus," "pharmacist," and "A1c." Duplicates were identified using Zotero and removed using recommendations from the Cochrane Systematic Review Handbook. Three reviewers screened for eligibility and risk of bias was assessed by 2 reviewers using the RoB2 Cochrane risk-of-bias tool.

Inclusion Criteria

Randomized controlled trials published in English with a CDTM pharmacist intervention for diabetes management, follow-up of at least 12 weeks, ambulatory care setting, and with a primary or secondary outcome of mean change in A1c from baseline to treatment end.

Exclusion Criteria

- Studies with intervention groups that included non-pharmacist interventions such as team visits with other health care providers
- Interventions only described as education, diabetes self-management education, medication therapy management, and/or deprescribing

RESULTS

Table 1. Study Characteristics

Author (Year)	Location	Setting	Age, years mean (SD)		Proportion male (%)		Duration of diabetes, years Mean (SD)		A1c Inclusion Criteria	Description of intervention
			Ctrl.	Int.	Ctrl.	Int.	Ctrl.	Int.		
Choe (2005)	Michigan, USA	Internal medicine clinic	51.0 (9)	52.2 (11.2)	46.10	48.80	NR	NR	≥ 8%	• Initial 1-hour face to face session includes CDTM and DSME • Follow-up scheduled as needed, usually monthly phone follow-up or co-visit with the primary care physician (PCP) • Diabetes status updates of intervention patients sent to providers
Jameson (2010)	Michigan, USA	Primary care network	49.7 (10.9)	49.3 (10.8)	49	48.9	NR	NR	≥ 9%	• Visits included DSME, assessment of adherence and optimization barriers, and CDTM (primarily in initiation and adjustment of insulin) • Follow-up for education, monitoring, and medication management
Rothman (2005)	North Carolina, USA	Internal medicine clinic	57 (11)	54 (13)	44	44	9(9)	8(9)	≥ 8%	• Visits included DSME, counseling, and CDTM • Follow-up sessions every 2-4 weeks • PCPs chose to be contacted before medication changes • Pharmacists trained a diabetes care coordinator available to the intervention group
Xu (2021)	Singapore	Primary health institution	59.9 (6.8)	59.7 (7.3)	61	69	13.8 (8.6)	13.5 (7.6)	> 7%	• Visits included DSME and CDTM • Follow up visits every 4-6 weeks as needed • Included visits to nurses and dietitians for holistic care

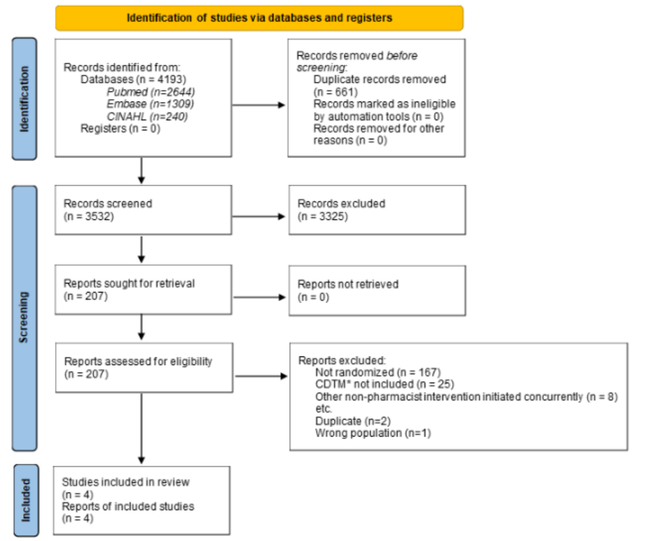
NR = not reported, Ctrl. = control, Int. = intervention

Table 2. Outcomes

Author (Year)	Duration (Months)	Group	# Participants	A1c at baseline	Change in A1c from baseline	Difference in mean change in A1c from baseline between groups (%)	Risk of bias assessment
Choe (2005)	12-24	Intervention	41	10.1 (1.8)	-2.1 (2.5)	1.2[c]	Low
		Control	39	10.2 (1.8)	-0.9 (2.0)		
Jameson (2010)	12	Intervention	52	10.4 (1.2)	-1.5 (4.9)	1.1[b]	Low
		Control	52	11.1 (1.6)	-0.4 (4.7)		
Rothman (2005)	12	Intervention	112	11 (2.0)	-2.5[a]	0.90	Low
		Control	105	11 (3.0)	-1.6[a]		
Xu (2021)	6	Intervention	126	8.4 (1.0)	−0.5 (1.5)	0.39[c]	Low
		Control	122	8.4 (1.1)	−0.11 (1.7)		

[a]range was not reported
[b]More patients in the intervention group improved their A1C level by at least 1% relative to the control group (67.3% vs 41.2%, p = 0.02)
[c]statistically significant

Figure 1. PRISMA Flow Diagram



CONCLUSIONS

Although not all statistically significant potentially due to small study sizes, majority of studies showed a change in A1c by about 1%. Addition of CDTM to pharmacist-led DSME and counseling should be considered when initiating or restructuring diabetes management services due to the positive impact on glycemic control.

Limitations to be addressed by future studies include heterogeneity in the intervention structure of the articles included, lack of pharmacist intervention comparators without CDTM, and exclusion of articles due to unclear descriptions of pharmacists' autonomy to adjust drug therapy.

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