

Effectiveness of group-based diabetes focused medical visits in primary care settings: a literature review

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Abstract

Introduction/Background

Type 2 diabetes mellitus (T2DM) is a significant public health concern, with many individuals failing to achieve recommended glycemic targets despite the availability of evidence-based guidelines and pharmacologic therapies. In Canada, between 2007 and 2019, 52.3% of adults with diabetes aged 18-79 met targets for glycemic control (3).

Primary care providers face increasing challenges in delivering comprehensive diabetes care within traditional one-on-one visit models (4). Group-based diabetes focused medical visits have been trialed as an alternative model designed to enhance patient education, peer support, resource efficiency, and ultimately glycemic control (5). The impact of this model on outcomes of glycemic control in primary care settings remains inconsistent in the literature (6).

Methods

A literature review was conducted using PubMed and Google Scholar. Studies were eligible if they employed experimental or quasi-experimental designs, were conducted in primary care settings, included adults with T2DM participating in group-based interventions, involved primary care providers, and reported A1C outcomes. Studies lacking a control group or adequate statistical power were excluded. Thirteen studies met inclusion criteria and were synthesized qualitatively in this review.

Results

Of the 13 included studies, eight demonstrated statistically significant improvements in A1C among participants receiving group-based care compared with usual care (1-2-4-8, 13). Four randomized controlled trials produced mixed findings, with some demonstrating short-term A1C improvements that were not sustained over longer follow-up (2, 7, 9,13). Secondary outcomes such as blood pressure and lipid levels were largely unchanged, whereas diabetes knowledge, quality of life, and patient satisfaction consistently improved (1,2,7,8).

Interpretation

Group-based diabetes focused medical visits in primary care settings are associated with modest improvements in glycemic control for selected populations, particularly in those with poor baseline control. While A1C outcomes are variable, consistent improvements in patient-centered and subjective outcomes suggest this model likely offers value beyond glycemic measures alone.

Keywords: Type 2 diabetes; group medical visits; shared medical appointments; primary care; glycemic control

Introduction/Background

Type 2 diabetes mellitus (T2DM) affects hundreds of millions of individuals globally and is a leading contributor to cardiovascular disease, kidney failure, vision loss, and premature mortality (1,2). Globally, the prevalence of diabetes has risen dramatically over the past several decades, driven by population aging, urbanization, sedentary lifestyles, and increasing rates of obesity (1,2). In Canada and the United States, diabetes affects approximately 10–11% of adults, with even higher prevalence among older adults, racialized populations, and individuals of lower socioeconomic status (3). Despite advances in pharmacotherapy and the widespread dissemination of clinical practice guidelines, a substantial proportion of patients fail to achieve recommended glycemic targets (3). Population-level data consistently demonstrate that fewer than half of adults with diabetes maintain hemoglobin A1C (A1C) levels within guideline-recommended ranges (3). The clinical consequences of poorly controlled diabetes are well established. Chronic hyperglycemia contributes to the development of microvascular complications, including retinopathy, nephropathy, and neuropathy, as well as macrovascular complications such as coronary artery disease, stroke, and peripheral vascular disease (1,2). Diabetes is also a leading cause of blindness, end-stage renal disease, and non-traumatic lower limb amputations. Importantly, individuals with diabetes experience reduced life expectancy and diminished quality of life compared with those without the disease (1). As a result, optimizing glycemic control remains a central goal of diabetes management and a key focus of primary care practice. In primary care settings, where most diabetes management occurs, clinicians face numerous challenges in delivering optimal diabetes care, including limited

visit time, increasing patient complexity, comorbid chronic conditions, and competing preventive and acute care demands (5).

Optimal diabetes management is premised on self-management education, behavioral change, medication titration, and psychosocial support (15). Self-management behaviors such as healthy eating, physical activity, blood glucose monitoring, medication adherence, and problem-solving are essential components of glycemic control (15). Psychosocial factors, including depression and anxiety, diabetes-related distress, social isolation, and limited health literacy, further complicate disease management for many patients (7). Traditional one-on-one primary care visits face limitations addressing these multifaceted needs, particularly for patients with limited health literacy or social resources (7). As a result, innovative care delivery models have been developed to enhance chronic disease management while maintaining efficiency within resource-constrained systems (8).

Shared medical appointments (SMAs), represent one such model (9). These visits typically involve multiple patients seen together by a primary care provider and a multidisciplinary team, combining individual clinical assessment with group education, facilitated discussion, and peer support (10). The theoretical foundations of group-based diabetes visits draw from several well-established frameworks, including adult learning theory, social cognitive theory, and the chronic care model (11). Adult learning theory emphasizes the importance of experiential learning, relevance, and active participation, all of which are facilitated through group discussion and shared problem-solving. Social cognitive theory highlights the role of observational learning, social modeling, and self-efficacy in behavior

change, suggesting that peer interaction may enhance motivation and confidence in diabetes self-management. The chronic care model underscores the importance of patients engaging with their care teams for comprehensive medical and social support, a dynamic that group visits are designed to promote (11).

Potential advantages of group-based diabetes visits include increased time for patient education, improved access to multidisciplinary expertise, enhanced peer learning, and more consistent delivery of guideline-recommended care (9). Group visits also improve efficiency by allowing providers to address multiple patients simultaneously, thereby increasing access to care without proportionally increasing provider workload. From a patient perspective, group visits may reduce feelings of isolation, normalize challenges associated with diabetes management, and foster a sense of community and shared accountability (7).

Despite these potential benefits, evidence regarding the effectiveness of group-based diabetes visits in improving glycemic control remains mixed. While some studies have demonstrated significant reductions in A1C and improvements in self-management behaviors, others have found minimal or no differences compared with usual care. Variability in study design, intervention structure, patient populations, and outcome measures complicates interpretation of the literature. Moreover, the degree to which findings are generalizable across diverse primary care settings remains uncertain.

The purpose of this literature review is to synthesize experimental and quasi-experimental evidence examining the effectiveness of group-based diabetes-focused medical visits in

primary care settings, with a particular focus on glycemic outcomes. The guiding research question for this review is: Do group-based diabetes-focused medical visits in primary care settings result in improved glycemic control compared with usual individual care?

Methods

A narrative literature review methodology was selected to allow synthesis of heterogeneous study designs and interventions (14). Studies were included in the review if they met the following criteria: They employed experimental or quasi-experimental study designs, including randomized controlled trials (RCTs), cluster randomized trials, pragmatic trials, or controlled retrospective studies; They were conducted in primary care or primary care-affiliated outpatient settings; They included adult participants diagnosed with type 2 diabetes; They evaluated group-based or shared medical visit interventions that involved diabetes-focused care; They included primary care providers (general practitioners, family physicians, nurse practitioners, physician assistants, or residents) as part of the intervention team; They reported glycemic outcomes, specifically hemoglobin A1C levels. Studies were excluded if they lacked a control group, were underpowered for statistical analysis, or did not involve primary care providers.

PubMed was searched using the search term: Diabetes[Title] AND ((Group[Title]) OR (Shared[Title])) AND ((Visit[Title]) OR (Appointment)), yielding 109 results. Titles and abstracts were screened for relevance, resulting in the exclusion of 65 articles that were

clearly unrelated to the research question. Thirty-five additional articles were reviewed and excluded for failing to meet inclusion criteria. Eight articles met all criteria and were included in the review.

Google Scholar was searched with terms including “Diabetes” AND “Group visit”; “Shared visit”; “Group appointment”; and “Shared appointment”. Over 1,000 results were screened, with 22 additional articles identified as potentially relevant. After removal of duplicates and full-text screening, five additional studies met inclusion criteria and were added to the review.

Study characteristics for review included study design, setting, sample size, population characteristics, intervention structure, duration and frequency of group visits, provider composition, glycemic outcomes, secondary outcomes, and reported strengths and limitations. Findings were synthesized narratively, with attention to patterns across study designs, populations, and intervention characteristics.

Results

The 13 included studies were published between 2001 and 2022. Eleven were conducted in the United States, four within Veterans Affairs (VA) health systems (4,10–12), one in Italy (7), and one in China (8). Study designs varied considerably. Three studies employed randomized controlled trial designs (7,9,13), two utilized cluster or pragmatic randomized designs (2,13), and eight were retrospective or quasi-experimental studies with non-

randomized comparison groups (1,4–6,10–12,14). Sample sizes ranged from fewer than 50 participants to several hundred, and follow-up periods varied from six months to two years.

Intervention structures also differed substantially across studies. Visit models included weekly to monthly frequency over largely varying durations. Most interventions incorporated multidisciplinary teams, often including nurses, diabetes educators, pharmacists, or social workers, in addition to primary care providers.

Table 1 – Study Characteristics & Design

Study	Location	Study Design	Sample Size (Experimental)	Population Characteristics	Control/ Comparison	Follow-up Duration
Baig et al., 2022	Midwestern US, Community Health Centers	Prospective controlled cohort	51	>18 yrs, A1C >8.0%	Usual care	6 & 12 months
Berry et al., 2016	Raleigh, NC	RCT, repeated measures	40	Low income, >18 yrs, A1C >8.0%	Control had equal visits	15 months
Caballero et al., 2015	Southern CA, VA	Retrospective comparison	52	Male veterans, A1C >8.5%	Usual care	Not standardized
Clancy et al., 2007	South Carolina	RCT	96	>18 yrs, A1C >8.0%	Usual care	1 year
Cunningham et al., 2018	Philadelphia	Retrospective comparison	230	>18 yrs, Type 2 diabetes	Matched controls	4 sessions (flexible)
Desouza et al., 2010	Omaha	Retrospective comparison	29	A1C <7.0% at program exit	PCP usual follow-up	1 year
Harris et al., 2016	Midwestern US VA	Retrospective comparison	371	>51 yrs, veterans, 98% male	Usual care	Not described
Heisler et al., 2021	5 US VA systems	Cluster RCT	809 (ITT), 588 attended ≥1 session	Veterans, predominantly white men	Usual care	6–12 months
Noya et al., 2020	Central Valley, CA	Quasi-experimental matched control	29	Low SES, Latin American	Matched controls	6 months
Reitz et al., 2012	Philadelphia	Quasi-experimental pre/post	52	>18 yrs, Type 2 diabetes	Matched controls	4 weeks
Tardi et al., 2012	Northwest Indiana	Retrospective comparison	62	Veterans, >45 yrs, A1C >8.5%	Usual care	Not standardized
Trento et al., 2001	Turin, Italy	RCT	59	Type 2 diabetes, non-insulin	Usual care	2 years
Yang et al., 2020	Urban China	Quasi-experimental, single blind	55	>60 yrs, no severe complications	Didactic education	5 months

Eight of the thirteen studies reported statistically significant improvements in A1C favoring group-based care compared with usual care (1-2, 4–8,14).

Baig et al. examined the impact of diabetes group visits in community health centers serving predominantly low-income and racially diverse populations (1). 51 participants in mid-western US Community Health Centers with A1C >8.0% attended monthly sessions for 6 months, with follow up at 6 and 12 months. Participants in the intervention group experienced mean A1C reductions of 1.04% at six months and 1.76% at twelve months, compared with minimal change in the control group. Notably, participants with baseline A1C levels above 9% demonstrated the greatest improvements, suggesting that group visits may be particularly beneficial for patients with poorly controlled diabetes.

Berry et al. designed a randomized controlled trial within a community-based medical setting (2). 40 participants in Raleigh, North Carolina with A1C > 8.0% attended five group sessions over 15 months, compared with an equal frequency of individual visits. Participants in the group visit program experienced a mean A1C reduction of 1.2%, while A1C levels increased among control patients who received an equivalent number of individual visits. This finding highlights the potential added value of the group-based format beyond increased visit frequency alone.

Tardi et al. studied monthly shared medical appointments compared with usual care among 52 veterans with A1C >8.5% in Indiana, with a retrospective comparison study at a single site. They found significantly greater reductions in A1C among group visit participants compared with those receiving usual care (4). Although the magnitude of improvement was smaller than in some community-based studies, the results suggest that group visits can be

effective even within already comprehensive, integrated health systems such as the Veteran's Affairs.

Noya et al. evaluated culturally tailored shared medical appointments for 29 low-income Latinx patients in California with T2DM (5). Participants in the intervention group achieved A1C reductions that were 0.8% greater than those observed in the control group. The culturally adapted curriculum and emphasis on social support were unique factors that may have contributed to the favorable outcomes.

Reitz et al. evaluated 52 patients in an urban family practice setting in Philadelphia and reported that a higher proportion of patients in a group visit program achieved A1C targets below 7% compared with controls receiving usual care (6). Less than half of the participants attended more than half of the sessions.

Trento et al. conducted a randomized controlled trial of group visits vs usual care among 59 participants in Turin, Italy (7). Over a two-year follow-up period, participants in the group visit intervention maintained stable A1C levels, while those in the control group experienced progressive worsening of glycemic control. This suggests the potential for group visits to sustain long-term glycemic stability rather than simply producing short-term improvements.

Yang et al. evaluated group visits among 55 patients over 60 years of age with T2DM in an urban community in China (8). Compared with participants receiving traditional didactic education, those attending group medical visits experienced significantly greater reductions in A1C, along with improvements in diabetes knowledge and self-care behaviors.

In contrast, five studies reported no statistically significant differences in A1C between group-based care and usual care (9–13). Clancy et al. conducted a rigorous randomized controlled trial among 96 participants with A1C >8.0% in South Carolina, and found no improvement in glycemic control among group visit participants compared with controls (9).

Cunningham et al. performed a retrospective comparison involving 230 participants in Philadelphia. Similarly, they observed no significant A1C change, which the authors attributed in part to low attendance and limited engagement in the group visits (10).

Desouza et al., Harris et al. and Caballero et al. examined retrospective cohorts within VA health systems in the US and found no significant differences in glycemic outcomes between patients participating in group clinics and those receiving usual care (11,12). Heisler et al. reported modest short-term improvements in A1C at six months among veterans attending shared medical appointments, but these gains were not sustained at twelve months (13).

While glycemic outcomes were mixed, secondary outcomes were more consistently favorable across studies. Blood pressure and lipid outcomes were generally similar between intervention and control groups, with few studies demonstrating significant differences (1,9,11–13). However, process-of-care measures such as rates of influenza vaccination, foot examinations, retinal screening, and adherence to guideline-recommended self-monitoring improved with several interventions. (1,7–9).

Patient-reported outcomes were among the most consistently improved domains. Multiple studies reported enhancements in diabetes knowledge, self-efficacy, self-management behaviors, and quality of life among group visit participants (1,2,7,8). Reductions in diabetes-related distress and improvements in patient satisfaction were also noted. These findings suggest that group-based interventions may address important psychosocial dimensions of diabetes care that are not fully captured by A1C measurements alone.

Table 2 – Intervention Details & Outcomes

Study	Group Size	HCP Type	Frequency & Duration	%A1C Change / Target Achievement	Other Outcomes	Strengths	Limitations
Baig et al., 2022	8–10	PCP individually at visits	Monthly, 6 months	-1.04% at 6mo; -1.76% at 12mo	QoL ↑, flu/foot/eye exam ↑	Multi-site	Curriculum not standardized; small sample; dropouts
Berry et al., 2016	8–10	GP/NP + multidisciplinary group	Every 3 mo, 5 sessions	-1.2% vs ↑1.3% in controls	General health scale ↑	Equal visits in control	Single site; 89% female; small sample
Caballero et al., 2015	8–15	NP-led team	Not standardized	50% reached A1C <8.0% vs 19% controls	Rate of A1C lowering ↑	None	Retrospective; all male veterans; single site
Clancy et al., 2007	14–17	IM physicians, nurses	Monthly, 1 year	No significant difference	ADA care indicators ↑	Randomized, blinded	Heterogeneous education; 82% African American
Cunningham et al., 2018	Variable	GP, CDE	4 × 2 hr sessions	No significant difference	None	Family practice setting	Very low completion; 87% African American
Desouza et al., 2010	8–10	Physician, CDE	Every 3 mo, 1 year	No significant difference	LDL, BP unchanged	2-year follow-up	Small sample; low frequency visits
Harris et al., 2016	Not described	Not described, VA SMA model	Not described	No significant difference	LDL, SBP, DBP unchanged	Large sample	Single VA center; male predominance; baseline differences
Heisler et al., 2021	Heterogeneous	Not described	Not standardized	Significant at 6mo, none at 12mo	SBP unchanged	Multi-site, large sample	Older white men; non-standardized interventions
Noya et al., 2020	~7	NP/physician	2/month, flexible, 6 mo	-0.8% vs controls	LDL, BP unchanged	Culturally tailored; engagement ↑	Self-selection; limited geography
Reitz et al., 2012	Not described	Multidisciplinary, GP	Weekly, 3 hr × 4 wks	76.9% achieved A1C <7% vs 54.3%	BP <140/90 ↑	Family practice	Less than half attended ≥50% sessions
Tardi et al., 2012	~7	NP, multidisciplinary	Monthly, 60–90 min	-1.48% vs -0.6% controls	Not reported	Reported attendance flexibility as strength	Single site; heterogeneous inclusion
Trento et al., 2001	9–10	GP, hospitalist	Every 3 wks, 4 sessions, 12 wks	A1C stable vs +0.9% controls	QoL ↑, knowledge ↑	Same visit frequency	Small sample; limited generalizability
Yang et al., 2020	26–27	PCP + multidisciplinary	Monthly, 5 mo	Significant reduction in difference	Self-efficacy ↑, self-management ↑	Structured education	Single urban site; older population

Discussion

This narrative review suggests that group-based diabetes-focused medical visits in primary care settings can result in modest but clinically meaningful improvements in glycemic control, particularly among patients with poor baseline A1C levels (1,2,4–7). However, findings across studies are inconsistent, with approximately one-third of included studies demonstrating no significant A1C benefit compared with usual care (9–13).

One of the primary factors contributing to variable outcomes is heterogeneity in intervention design. Group visit models differed widely in terms of visit frequency, duration, curriculum, group size, provider composition, and degree of clinical management integrated into the sessions (6,13). Some interventions placed emphasis on education and peer support, while others focused more heavily on medication titration and clinical monitoring. These differences likely influenced the magnitude and sustainability of glycemic improvements.

Medication management represents a critical but underreported component of many interventions. Few studies provided detailed information on rates of medication intensification, insulin initiation, or therapeutic adjustments during group visits (1,9,13). As a result, it remains unclear whether observed improvements in A1C were driven primarily by behavioral changes, pharmacologic optimization, or a combination of both. Future research should explicitly examine these mechanisms to better understand more specifically how group visits exert their effects.

Population characteristics also appeared to influence outcomes. Studies demonstrating the most substantial A1C improvements often targeted high-risk or underserved populations, including individuals with poor baseline control, low income, or limited access to care (1,2,5). In contrast, VA-based studies involving older, predominantly male populations with relatively stable access to care showed less consistent benefits (4,11–13). These findings suggest that group visits may be particularly effective when they address unmet needs related to education, support, and access.

Importantly, this review highlights the limitations of relying solely on A1C as the primary outcome for evaluating group-based interventions. While glycemic control is a critical clinical endpoint, it may not fully capture the value of interventions designed to enhance patient engagement, self-efficacy, and quality of life. Consistent improvements in patient-reported outcomes and preventive care processes suggest that group visits may offer meaningful benefits aligned with patient-centered care, even in the absence of large A1C reductions (1,2,7,8).

The lack of sustained glycemic improvement observed in some studies underscores the potential need for ongoing engagement and integration of group visits into longitudinal care models (13). Short-term interventions may produce initial gains that diminish once the structured support ends. Embedding group visits as an ongoing component of primary care may be necessary to maintain long-term benefits.

There are several limitations of this review that should be acknowledged. The heterogeneity of study designs and interventions limits comparability across studies. There was a paucity

of reporting on key elements such as medication management, with obvious implications for outcomes of glycemic control. Further inconsistencies were found in reporting of attendance rates, which further complicates interpretation. The predominance of U.S.-based studies, particularly those conducted within VA health systems, limits generalizability to other health care contexts and populations (4,10–12).

Additionally, publication bias may have influenced the available evidence, as studies demonstrating positive outcomes may be more likely to be published. The narrative review methodology, while appropriate for this topic, does not provide the quantitative value of a systematic review or meta-analysis.

Group-based diabetes-focused medical visits in primary care settings are associated with modest improvements in glycemic control among selected populations, particularly individuals with poor baseline glycemic control and unmet educational or psychosocial needs (1,2,4–7). While A1C outcomes are inconsistent across studies, improvements in patient-centered outcomes, self-management behaviors, and preventive care processes suggest value beyond glycemic measures alone.

Future research should focus on standardizing intervention components, clarifying mechanisms of glycemic control and secondary outcomes, and evaluating long-term sustainability across diverse populations and health care systems. High-quality, patient-centered research is needed to determine the optimal role of group-based care models in the evolving and increasingly demanding landscape of diabetes management.

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