

The Impact of the Multidisciplinary Team on Medication Adherence in Type 2 Diabetes: A Narrative Review

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Abstract: Type 2 diabetes mellitus (T2DM) is a highly prevalent chronic disease associated with multiple long-term conditions (Multimorbidity) requiring frequent reviews and escalating pharmacotherapy. However, attainment of glycemic targets in routine clinical practice remains suboptimal, with medication non-adherence representing a major contributor to the efficacy-effectiveness gap. This narrative review summarizes the impact of multidisciplinary team (MDT) care on medication adherence in people with T2DM. We searched MEDLINE, Embase and CINAHL (9 December 2025), supplemented by Google Scholar and reference-list screening, to identify evidence on MDT models and medication adherence outcomes in adults with T2DM. We mainly included original research (n = 19) with the addition of relevant reviews (n = 2) and systematic reviews (n = 4). Overall, multifaceted interventions and collaborated care involving the MDT were associated with improved medication adherence, particularly where teams were integrated and preserved continuity rather than operating as parallel services. Medication focused MDT interventions, most commonly pharmacist led medication review and follow-up, were generally associated with improvements in adherence and, in some studies, improvements in outcomes such as quality of life and healthcare utilization. However, reliance on self-report measures and variable intervention intensity limited comparability. Behavioral adherence support, delivered by nurses or other MDT members using motivational and action planning techniques, showed modest improvements when objectively measured. Additionally, psychosocially integrated approaches addressing depression, diabetes distress and social vulnerability showed potential to improve adherence and clinical outcomes, though adherence was not consistently measured directly. Overall, MDT care appears most likely to improve adherence when interventions are structured, roles within the team are clearly defined, collaboration between professions is well integrated, behavioral and psychosocial barriers are addressed, and follow-up is of sufficient intensity and duration. Future research should standardize adherence outcomes, incorporate objective measures where feasible, control for additional consultation time, and evaluate durability and scalability of multifaceted MDT approaches beyond short-term follow-up.

Keywords: multidisciplinary team, type 2 diabetes mellitus, patient-centered care, interdisciplinary care, medication adherence

Introduction

Burden of Type 2 Diabetes

Diabetes is a highly prevalent condition, affecting 589 million people worldwide in 2024, representing 11.1% of the population between 20 and 79 years old, and is projected to rise to 853 million by 2050.¹ Over 90% of diabetes cases are attributable to type 2 diabetes (T2DM).² T2DM is characterized by chronic hyperglycemia resulting from a combination of insulin resistance and inadequate pancreatic insulin secretion.³

The major clinical and economic burden of T2DM arises from its microvascular (retinopathy, chronic kidney disease, peripheral neuropathy) and macrovascular (cardiovascular disease, stroke, peripheral artery disease) complications and its association with multiple long-term conditions (also known as multimorbidity). Achieving glycemic control reduces the risk of developing complications, and multifactorial risk reduction is key in contemporary diabetes care.⁴⁻⁶ Despite advances in pharmacotherapies and the importance of managing diabetes as a priority for healthcare systems, the achievement of T2DM

risk factor targets (ie, glycated hemoglobin (HbA1c), blood pressure, low-density-lipoprotein cholesterol (LDL-C)) remains sub-optimal. Approximately half of individuals with T2DM achieve recommended individual targets for HbA1c, blood pressure or LDL-C, with only one in eight achieving all three targets simultaneously.⁷ It is of particular concern that these low levels of attainment have not improved over recent decades.⁷

Medication Non-Adherence

Whilst lifestyle and diet are important areas to modify in the treatment of diabetes, pharmacotherapy is commonly required to address the underlying pathophysiology of T2DM. Treatment escalation is common as T2DM progresses, and many patients are prescribed concurrent therapies, such as, statins and newer classes of glucose lowering medications aimed at modifying cardiovascular and kidney disease risk independent of glycemic control.^{8,9} Consequently, medication burden is often substantial. In a recent population-based study using Scottish healthcare data, people with T2DM were prescribed a mean of nine medications.¹⁰

Real world observational studies show attenuated benefits in drug therapy compared to those reported in randomized control trials.¹¹ A major contributor to this discrepancy is medication adherence.¹² Medication adherence is defined as “the extent to which a patient acts in accordance with the prescribed interval, and dose of a dosing regimen”.¹³ Medication non-adherence can occur in several forms, including primary non-adherence, in which the prescribed medication is not initiated, and secondary non-adherence, which occurs after treatment initiation and includes poor implementation (ie, medications not taken as prescribed) and non-persistence (ie, early discontinuation).¹⁴

Medication adherence can be assessed using a range of objective and subjective methods, including pharmacy refill-based metrics such as proportion of days covered (PDC) and medication possession ratio (MPR), as well as validated self-reporting tools (eg Morisky Medication Adherence Scale and Medication Adherence Report Scale - MARS-5)^{15,16} Direct measures, such as urine and plasma concentrations of the drug, can be used to measure adherence, however, these measures are labor intensive and require specialist laboratory testing, limiting their use.¹⁷ In chronic disease research, adherence is commonly operationalized as an individual taking $\geq 80\%$ of prescribed doses of a given medication within a given timeframe (or PDC/MPR $\geq 80\%$), although definitions vary by study and measure.¹⁸ This variation in measurement approach is important when interpreting adherence studies, as refill-based, self-reported, and biochemical measures capture different aspects of medication-taking behavior and may produce different adherence estimates.

Prevalence of Adherence and Persistence

Medical non-adherence represents a substantial and persistent burden in T2DM. A World Health Organization (WHO) report estimated that, on average, 50% of people with chronic diseases have poor medication adherence.¹⁹ The prevalence of adherence in T2DM varies substantially in individual studies, with one meta-analysis finding overall poor adherence of 44% (95% CI 33–56%) in people with T2DM.²⁰

Primary non-adherence (ie, prescribed medication that is not initiated) is also prevalent in T2DM. In a large observational study, 31.4% of new diabetes prescriptions were not filled.²¹ While other studies show that 10% of patients did not fill the first prescription given, and a further 15% had early non-persistence (ie, those who fail to continue the medication after the initial month).²² Finally, discontinuation is common and approximately a quarter of people with diabetes eventually stop their medication (Table 1).²³

Table 1 Prevalence Estimates for Different Stages of Medication Non-Adherence for Type 2 Diabetes Mellitus

Adherence Phase	Non-Adherence Type	Prevalence
Initiation	Primary non-adherence (non-initiation)	3.6–31.4% ^{21,22,24}
Implementation	Poor implementation (medications started but not taken as prescribed)	44% ²⁰
Persistence	Early non-persistence (no timely refill after first dose)	14.7–25.7% ²⁴
Discontinuation	Non-persistence/discontinuation (60-day gap and not restarting medication)	25% ²³

Medication adherence is of substantial clinical importance. Higher adherence is consistently associated with lower HbA1c values,²⁵ whereas poor adherence is associated with higher healthcare utilization and worse outcomes, which leads to increased costs.^{26,27} A meta-analysis reported good adherence (>80% in self-reported or pill refill data) was associated with a 10% reduction in hospitalization and 28% reduction in all-cause mortality.²⁸ Additionally, lower medication adherence measured by PDC has been associated with increased risk of mortality, cerebrovascular disease and myocardial infarction in T2DM.²⁹ Addressing medication adherence represents a key area to improve outcomes in T2DM.

Determinants of Adherence

The conceptual framework underpinning this review is the World Health Organization Multidimensional Adherence Model (WHO-MAM). This model emphasizes that medication adherence is not determined solely by patient motivation, but is shaped by five interacting domains: social/economic, therapy-related, patient-related, condition-related, and health system/health care team factors (Figure 1).³⁰ Social and economic constraints (deprivation, unemployment, and cost barriers) are consistently associated with poor adherence.^{31,32} Therapy-related factors such as treatment complexity, dosing frequency, insulin use, adverse effects (such as, hypoglycemic and weight gain) and requirements for drug monitoring can adversely affect adherence.^{33–35} Patient-related determinants include beliefs about necessity versus concerns with the medication, psychological co-morbidity, diabetes distress and health literacy.^{36,37} Condition-related factors specific to T2DM include the initial asymptomatic early course of the disease, which may reduce perceived benefit of treatment, as well as co-morbidities associated with diabetes resulting in polypharmacy and competing health priorities. Finally, healthcare system factors including continuity, access, communication, trust and follow up frequency, have a role in adherence behaviours.³⁸ As such, medication adherence in T2DM is multifactorial and is typically not effectively addressed through isolated or ad-hoc clinical encounters alone.³⁹

Multidisciplinary Team (MDT)

In diabetes care, a multidisciplinary team (MDT) is an organized model of care in which health professionals from different disciplines with diabetes expertise who work collaboratively, alongside the person with diabetes, to plan and deliver care, including risk factor management, education/self-management support, and prevention or management of complications. Effective diabetes care requires specialists to work in MDTs. Specialist diabetes MDTs can comprise physicians, pharmacists, nurses, podiatrists, dietitians, and clinical psychologists, while also collaborating with other relevant specialists as needed.⁴⁰ Beyond assembling an MDT, effective diabetes care depends on collaborative practice, for example, professionals from different disciplines working together to deliver high-quality care across settings. In practice, this means avoiding discipline “silos” by using explicit coordination processes, such as MDT discussion, to ensure care activities are deliberately organized and consistent over time.⁴¹ Evidence has shown MDT care improves a range of outcomes important in diabetes care, these include reductions in HbA1c, blood pressure, lipid levels and patient satisfaction.^{42–44}

Rationale for MDT Care in Improving Medication Adherence

The WHO-MAM domains (Figure 1) align closely with an MDT model of care which is well suited to addressing the multifaceted mediators of medication adherence through regular reviews, education, and behavioral support.³⁰ The DAWN (Diabetes, Attitudes, Wishes and Needs) studies highlighted the high psychological burden associated with T2DM and that unmet support was widespread. Care delivered by a co-located team with better provider-patient relations was positively associated with adherence.^{45–47}

Medication non-adherence may be perceived by healthcare professionals as irresponsible behavior by patients; however, the patient perspective is very different. Non-adherence often reflects a complex process of adjustment to chronic illness, informed by individuals’ experiences of how the disease affects them, perceptions of control, and the meaning of long-term medication use. Accepting pharmacotherapy may require patients to reconcile perceived benefits with concerns about possible side effects and uncertainty around necessity.⁴⁸ Therefore, medication adherence is a complex area that requires time, trust and empathy to tackle.⁴⁸ This lends itself to an MDT model of care, rather than the acute care model where a single healthcare professional is expected to perform all the functions needed to tackle adherence, typically within a short period of time.

The MDT care model approaches the management of these conditions from a different perspective. This includes utilizing the community sector, patient self-management, and team-based care. Within this model, the MDT requires

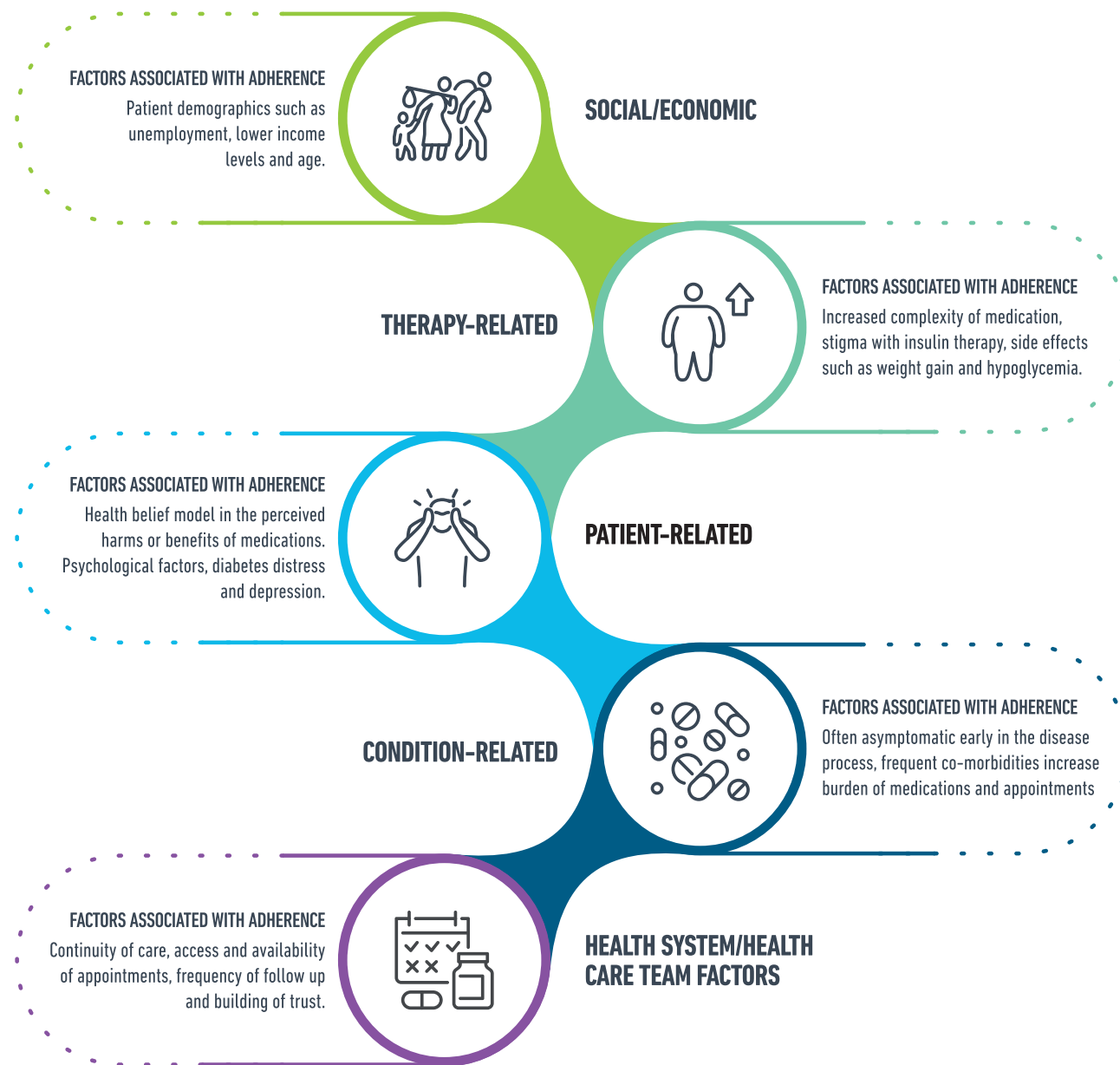


Figure 1 The World Health Organization Multidimensional Adherence Model (WHO-MAM) domains influencing medication adherence with factors that correlate to the five domains.

a host of team members working collaboratively and able to flexibly manage patients.⁴⁹ This is opposed to the rigid hierarchy often seen in the traditional models of healthcare. Moreover, the patient is regarded as a member of the MDT rather than a passive recipient of care. As the patient is core in the management and decision making in an MDT approach, this addresses gaps in patient involvement, engagement, support and potentially medication adherence (Figure 2).

Given the persistent gap in risk factor target attainment and the clinical and economic impact of non-adherence,^{7,50} it is important to explore how MDT models of care influence medication adherence and to identify which, if any, MDT components are most effective. Therefore, this narrative review synthesizes the available evidence regarding the impact of MDT models of care on medication adherence and persistence in adults with T2DM. Unlike other reviews that have examined medication adherence more broadly, this review uniquely focuses on MDT interventions in the improvement of medication adherence in those with T2DM.

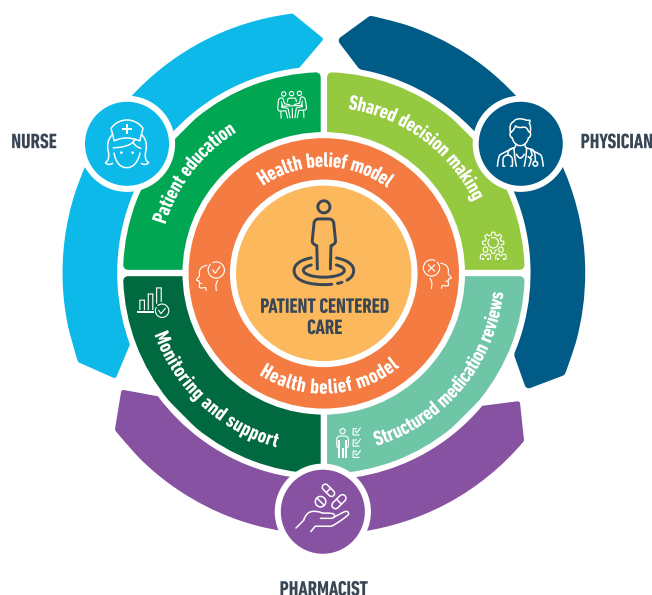


Figure 2 Schematic representation of patient-centered care within a multidisciplinary team (MDT) framework. Patient-centered care sits at the core, with the Health Belief Model conceptualizing how perceptions and beliefs shape self-management behaviors. Surrounding domains comprise of patient education, monitoring and support, shared decision making, and structured medication reviews, which are delivered collaboratively across professions, with overlapping roles and flexibility for task-sharing between nurses, physicians, and pharmacists to optimize care and address modifiable determinants.

Methods

Review Design and Scope

A narrative review was undertaken to summarize and interpret evidence examining how MDT care influences medication adherence in adults with T2DM. As the primary aim was to explore concepts, mechanisms, and intervention characteristics across a heterogeneous body of literature, a formal systematic review methodology was not employed.

Literature searches were performed in MEDLINE, Embase, and CINAHL from database inception to 9 December 2025 ($n = 1371$ results). The search strategy combined medical subject headings (MeSH) terms and free-text keywords across three core concepts: T2DM, medication adherence and persistence, and multidisciplinary, inter-professional, or team-based care. MDT interventions were broadly defined and included models involving at least two professions (eg nurse and physician) working collaboratively with the patient or the addition of an MDT member to an existing care team. To capture practice-relevant evidence that may not be well indexed, supplementary searching was undertaken through reference list screening and Google Scholar searches. Only English language publications were considered.

Literature Search and Evidence Selection

Search terms included, but were not limited to, “Diabetes Mellitus, Type 2”, “Medication Adherence”, “Patient Care Team”, “Interdisciplinary Health Teams”, “Interprofessional”, “multidisciplin*”, “interdisciplin*”, “interprofession*”, and “team-based”. Synonyms and alternative terminology were also incorporated to ensure comprehensive retrieval of relevant literature.

Evidence was considered which addressed MDT/interprofessional/team-based care in adults with T2DM and reported medication adherence-related outcomes (eg objective measures of adherence or validated self-reported questionnaires) or provided substantive insight into MDT mechanisms likely to influence medication taking. In line with the narrative review approach, higher quality evidence was prioritized where available, including meta-analyses, randomized controlled trials (RCT), and reviews. We mainly included original research ($n = 19$) with the addition of relevant reviews ($n = 2$) or systematic reviews ($n = 4$). Findings were synthesized narratively, focusing on the type of MDT model, key intervention components, methods of adherence assessment, and the direction and consistency of reported effects.

Findings

This narrative review synthesized evidence on the role of MDT care in supporting medication adherence in type 2 diabetes, with particular emphasis on how coordinated, patient-centered approaches can address the multifactorial barriers that influence medication-taking behavior. The available literature spans a range of MDT configurations and intervention intensities. Some studies evaluated the addition of a single MDT professional (most commonly a pharmacist) to usual care and reported adherence outcomes alongside clinical markers such as blood pressure and HbA1c.^{51,52} Other studies assessed behavioral strategies, such as motivational interviewing or cognitive behavioral approaches, delivered by MDT members (eg nurses or psychologists) to target adherence-related beliefs and routines.^{53,54} Furthermore, other studies examined MDT and coordinated care or collaboration between professions more generally to evaluate the advantages with respect to adherence.^{55–57} Common themes emerged within the umbrella of MDT care. These themes were grouped by the type of MDT model and discussed under the following sub-sections of, coordinated care models, medication focused MDT models, behavioral adherence support, psychological integrated support.

MDT Interventions to Improve Medication Adherence

Coordinated Care Models

Coordinated care models aim to improve medication adherence by providing structured follow up, shared care planning and consistent advice across healthcare professionals. In T2DM, reliance on a single clinician to manage hyperglycemia, cardiometabolic risk, education, and psychosocial needs is challenging for both patients and healthcare professionals. MDT care may improve adherence by leveraging diverse skill sets and collaboration between professions.⁴¹

Qualitative studies show that coordinated care can impact medication adherence. In a study exploring Belgian primary care practitioners' perspectives on adherence in those with T2DM, clinicians identified care structure as a key barrier.⁵⁸ For example, adequate follow up is required rather than “ad-hoc” consultations. The practitioners acknowledged that working within a team is more effective, as advice can be reinforced, and the time spent with the patient is greater. Overall, the primary care team's frustration stemmed from the failure to achieve a desirable outcome and the responsibility may inappropriately lie solely with the doctor. The MDT model would help to alleviate the pressure on a single healthcare professional and would allow better relations to form within the patient and the care team.⁵⁸

In contrast, a focus group involving people with T2DM felt physicians time was limited and that gaining expertise on all aspects of diabetes care was too difficult.⁵⁹ They were strongly in favor of a teams-based approach, including related disciplines such as nurses, social care, specialist endocrinologist and physical therapists. This study showed although primary physicians were well liked by their patients, they needed a broader care team to manage all the complexities of diabetes.⁵⁹

Another qualitative study found high levels of self-blame among both physicians and patients for failing to achieve targets.⁶⁰ Suggesting that assigning the sole responsibility of care on the physician or patient is counterproductive in progressing the ongoing management of diabetes.

However, coordination of care must not lead to fragmented care. Continuity of care is important and is valued by patients, with one study showing odds of good adherence were 3.37 (95% CI 3.15–3.60) in settings with high or intermediate levels of continuity of care.⁶¹ Therefore, effective MDTs require integration and collaboration rather than multiple parallel services.

Systematic reviews have emphasized that successful MDT interventions involve close interdisciplinary collaboration, clear communication, and defined roles. Celio et al reviewed 21 publications involving nurse and/or pharmacist's interventions to improve medication adherence, of which four studies showed improvements in both adherence and clinical outcomes.⁵⁶ There were positive findings of adherence in studies that showed strong collaboration between team members, and this also improved satisfaction of both patients and professionals.⁵⁶ The review emphasized that interdisciplinary working implies close collaboration rather than working in parallel. Also, positive studies commonly included clear communication and well-defined roles. While pharmacists and nurses contribute different expertise, there were overlapping techniques such as, motivational interviewing, education, self-management support.

Wilhelmsen et al performed an overview of eight systematic reviews on medication adherence interventions effect on clinical and economic outcomes⁵⁵ The most frequent intervention in these reviews was patient education delivered by nurses or pharmacists. Interestingly, four RCTs in which physicians assessed adherence did not demonstrate positive

results for morbidity or healthcare utilization. In contrast, implementation of prescribing pharmacists showed a decrease in morbidity, potentially reflecting greater attention to adverse effects, or utilizing a more careful guideline approach. Given the mixed results, no single intervention can be recommended as a definitive approach to tackle adherence, a range of context-specific interventions should be considered.

Finally, a systematic review by Sapkota et al of interventions on adherence in T2DM included 49 studies out of which 22 showed improvement in adherence, with the majority of the positive studies being multifaceted interventions⁵⁷ Several studies which showed improved adherence involved MDTs, including team members such as pharmacists, nurses, coaches, community health care workers, and peer supporters. More contemporary studies included in this review addressed cultural factors, cognitive issues, and more patient centered care. Psychosocial issues were prominent in the management of adherence issues, and combined interventions were recommended.

Medication Focused MDT Interventions

Medication-focused MDT interventions most commonly involve pharmacists, whose training emphasizes medication indication, dosing, interactions, adverse effects, and monitoring. Embedded within diabetes care, pharmacists are well placed to conduct structured medication reviews, identify, and address practical barriers (such as dosing complexity, side effects, misconceptions), and reinforce shared decision making and long-term treatment rationale, tasks that are often constrained in routine primary care consultations with competing priorities and limited time.^{62,63} In many health systems, pharmacists' clinical scope is expanding (including prescribing roles in some settings), enabling more direct contribution to medication optimization within MDT care.⁶⁴

Systematic reviews have suggested that the addition of pharmacists to the care team improves medication adherence. Antoine et al reviewed six RCTs evaluating pharmacist-led interventions targeting adherence and found favorable trends across all studies, although statistically significant adherence improvements were observed in only two trials⁶⁵ Most interventions included educational components addressing diet, medication use and lifestyle. Adherence was commonly assessed by self-reported measures, prescription refill rates or pill counting. Considerable variation existed in intervention intensity includes the time spent with the patient and the frequency in the encounters. Notably, a few studies reported improvements in clinical parameters such as, blood pressure and blood glucose.

Presley et al synthesized 59 studies across diabetes populations and reported an overall improvement associated with pharmacist interventions. However, included interventions and outcomes were broad, and analyses combined type 1 and type 2 diabetes without stratification, limiting inference for T2DM specifically.⁶³ In subgroup analyses focused on adherence (19 studies), improvement was observed, but reliance on self-reported adherence remained a key limitation.

Individual studies have provided insight into pharmacist-led interventions, demonstrating positive effects on medication adherence. Ebid et al conducted a prospective trial in Egypt involving 100 participants⁵² In this study, pharmacists were added to usual care, with patients receiving a consultation with a pharmacist after a consultation with a physician. Medication adherence was measured using the Morisky Green Levine scale. Participants in the pharmacist intervention group showed an improvement in medication adherence scores from 11.8 to 15.1, whereas the control group experienced a decrease from 13.4 to 12.7.⁵² These results suggest that pharmacist involvement improved adherence, likely thorough explanations on medication use, adverse effects and reinforcing the importance of therapies. In addition to adherence, the intervention led to improvements in other outcomes, such as diet, exercise and self-monitoring, indicating that the intervention may enhance overall diabetes management rather than adherence alone.

Additional evidence includes a quasi-experimental study in Taiwan, which added pharmacists to an existing MDT (physicians, nurses and dieticians) in diabetes management, with the outcomes of health literacy, adherence and biochemical parameters such as HbA1c.⁵¹ The intervention included one to one meetings with the pharmacist for 6 months which were 30–60 minutes long. Adherence was measured using the 8-item Morisky Adherence Scale (MMAS-8), a higher score indicating greater adherence through a self-reported questionnaire. In this study, MMAS-8 improved from 5.40 to 6.50. However, this measure also improved in the control group from 5.29 to 6.19, albeit by a smaller amount. The between group differences were not significant indicating either a modest incremental effect of pharmacist involvement or potential improvement from usual MDT care and study participation itself.⁵¹

In contrast, Bandiera et al used an objective measure of an electronic monitoring system (MEMS) for adherence over 24 months in people with diabetes and chronic kidney disease, a 6-month and a 12-month intervention group was included.⁶⁶ This was an open label study with the patients being aware being monitored for adherence as the adherence graphs were shown and discussed with them. There was a high level of adherence for both the 6-month intervention group and 12-month intervention group (87.4% and 92.5%, respectively) at the 6-month time point. At the end of the study at 24 months, there was a reduction in adherence to 85.6% and 88.6% in the 6 month and 12-month intervention groups, respectively. The authors concluded a longer duration of pharmacist intervention is beneficial in maintaining adherence over a longer period. Although an objective measure was used to measure adherence, the participants were aware and discussions regarding their adherence levels likely introduced bias. Additionally, these results are difficult to interpret given the absence of a control group and baseline adherence not being reported.

Evidence from lower income countries have also shown efficacy in introducing additional members to an MDT. A randomized control study from Ethiopia studied adherence in T2DM using the Morisky scale in 127 patients.⁶⁷ They found significant improvements in good adherence in the intervention group from 9.2% at baseline to 61% at 6 months ($p < 0.001$). This was compared to a control group where adherence improved from 13.2% to 30.2% ($p = 0.261$). This study included pharmacist intervention immediately after the physician consultation which lasted 45 minutes and included a range of educational and personalised advice on medications, as well as telephone follow up for the intervention group.

In addition to pharmacists, other members of the MDT have been studied in interventions involving medication reviews. A randomized control trial (ENHANCED) deployed dietitians for protocol driven medication initiation and titration in the intervention group compared to usual care.⁶⁸ They found an OR of 3.38 ($p = 0.014$) in high medication adherence compared to the control group, suggesting adherence can be adequately addressed by allied health professionals.⁶⁸ Interestingly, there was no improvement in HbA1c compared to the control group ($p = 0.702$).⁶⁸

A study in Brazil which added pharmacists to their outpatient specialist care found positive results in improving medication adherence (a 33% increase in the proportion of participants achieving good adherence), in addition to HbA1c levels and systolic blood pressure.⁶⁹ Particularly, the pharmacists were well integrated into the outpatient's clinic, for example, they consulted the patients after the secondary care appointment and further follow up appointments before the next planned appointment with the usual care team. These studies evidence clear benefits when other members of the MDT (eg pharmacists and dieticians) can collaborate with the rest of the MDT by being present in the same place and time.

Behavioral Adherence Support

Medication non-adherence in T2DM is multifactorial, but behavioral determinants are common and can be conceptualized as unintentional non-adherence (eg forgetting or disrupted routines) and intentional non-adherence driven by beliefs and concerns about medicines. The Health Belief Model provides a useful framework for understanding these behaviors, as some individuals may underestimate the harms of diabetes (eg future complications) or doubts that medicines will meaningfully improve outcomes such as HbA1c.^{37,38} Interestingly, only around a quarter of people with T2DM know their latest HbA1c level.^{70,71} Awareness of HbA1c targets have been shown to improve glycemic control and adherence to medications.⁷² These findings support the rationale for MDT-delivered behavioral support that combines education with person-centered approaches to strengthen motivation, routines, and self-management (Figure 3).

Farmer et al evaluated brief nurse-led behavioral interventions for adults with T2DM in primary care to tackle medication adherence. In a single 30-minute consultation, nurses used a motivational component based on the "Theory of Planned Behavior" and a structured action planning ("if-then") exercise to address both intentional and unintentional non-adherence.⁵³ Over 12 weeks, the intervention group improved against objectively measured adherence to oral glucose-lowering therapy compared with standard care (77.4% vs 69.0% adherent days; mean difference +8.4%, 95% CI 0.2–16.7; $p = 0.044$),⁵³ supporting nurses as key MDT members for behavior focused adherence support.

The PRISMA study (Proactive Interdisciplinary Self-Management) in the Netherlands introduced group sessions to usual care that were focused on structured education with the use of nurses and dieticians.⁵⁴ Adherence was assessed using pharmacy refill data (MPR), self-reported data (MARS-5), and drug holidays (>3-day gaps). In this study, there was an overall high level of adherence in both groups. Although MPR and MARS-5 scores were high in both groups, the

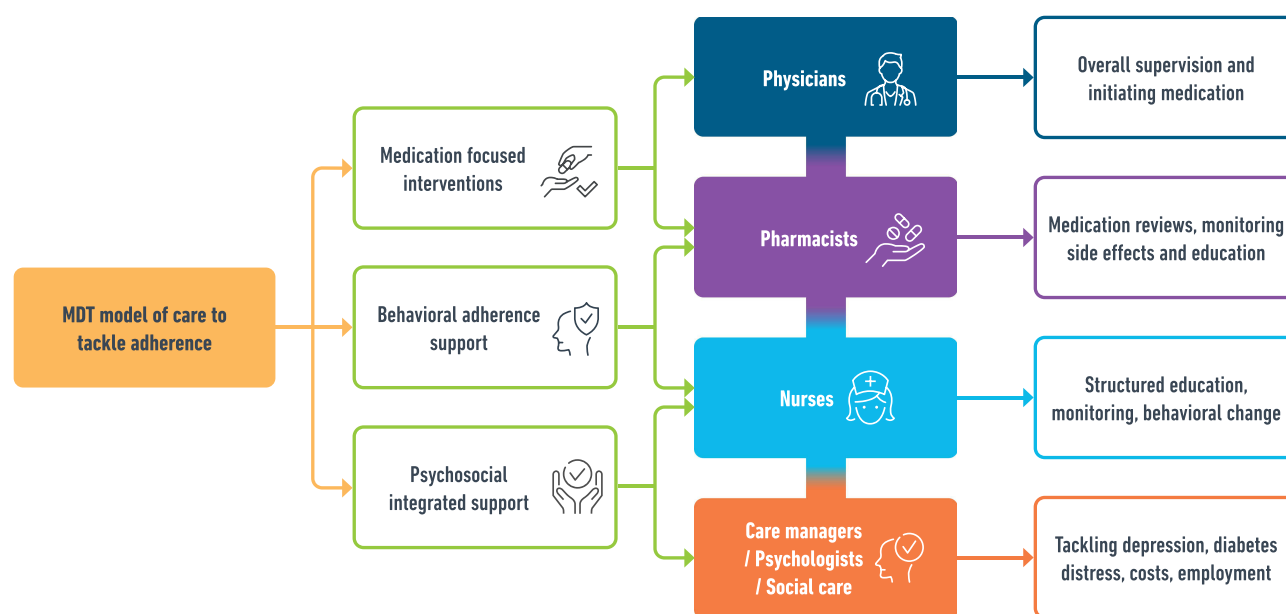


Figure 3 MDT model to support adherence in diabetes care. The pathway is organized around three core intervention domains, medication-focused interventions, behavioral adherence support, and psychosocial integrated support. Professional roles overlap and care is delivered collaboratively, allowing flexibility in who undertakes tasks (eg medication review and side-effect monitoring, and structured education).

intervention group experienced fewer drug holidays (25% vs 53.8%).⁵⁴ This study showed brief interruptions in therapy may occur even among patients who appear adherent on other measures.

The wider MDT team can also help improve poor medication adherence. For example, a study involving occupational therapists used motivational interviewing to improve medication adherence in people with T2DM. Although the results were positive, they did not reach statistical significance.⁷³

Psychosocial Integrated Support

Psychosocial factors are important determinants to medication adherence in T2DM. Depression co-exists with type 2 diabetes at a higher rate than in the general population (19% versus 11%, respectively).⁷⁴ More so, diabetes distress, an emotional state of increased psychological stress, is highly prevalent, affecting 36% in people with T2DM.⁷⁵ Higher baseline diabetes distress predicts poorer medication adherence, with one study showing a standardized regression coefficient of a modest size ($\beta = -0.29$, $p = 0.001$).⁷⁶ These findings support MDT models that integrate psychological and social care alongside routine diabetes management. A review of adherence in people with diabetes and comorbid depression identified effective interventions spanning both diabetes focused strategies (eg optimizing glycemic management and medication regimens), psychosocial approaches, including antidepressant therapy (eg sertraline) and psychologist-delivered cognitive behavioral therapy.⁷⁷ This evidence lends itself to the need for an MDT approach as specialized staff empowered in addressing psychological conditions are needed to ensure the patient is cared for holistically.

An innovative study (3 Dimensions of Care For Diabetes) conducted in a deprived area of London, United Kingdom, comprising a diabetologist, psychiatrist, social worker and family psychotherapist aimed to tackle the mental health aspects of diabetes care as well as socioeconomic determinants of health in poorly controlled T2DM.⁷⁸ There was an impressive reduction in HbA1c of 1.4% (15 mmol/mol), which is comparable with many effective diabetes therapies. Importantly, there was also a reduction in hospital admissions.⁷⁸ Although adherence was not specifically measured, this was discussed as a plausible reason for improvement. These findings align with another study that found depressive symptoms, smoking, and living alone or without a marital partner to be associated with lower medication adherence.⁷⁹

Bogner et al conducted a randomized control trial evaluating the impact of integrated care managers for those with diabetes and depression.⁸⁰ Adherence was measured objectively using a Medication Event Monitoring System (MEMS), with a target of >80% medication adherence, measured at baseline, 6 weeks, and 12 weeks. The intervention increased

the proportion of patients achieving good adherence from approximately 36% to 65%, whilst adherence in the usual care group declined over the same period.⁸⁰ Notably, this was achieved with a modest additional intervention time of 3 hours over the 3 months and included specific support and advice on adherence. The care managers were not traditional clinical roles, such as pharmacists, nurses, or physicians, highlighting that MDTs can include a wider range of professions to effectively support adherence.

Limitations of the Evidence

This review included a broad range of evidence on the impact of MDTs on medication adherence in adults with T2DM. As a narrative review, systematic processes for search, screening, data extraction and quality assessment were not performed. Consequently, this review may not include an exhaustive list of all relevant publications in the area but highlights key studies on medication adherence in T2DM.

Nevertheless, the review draws on recent and diverse evidence, including studies from different healthcare systems, geographical settings, MDT configurations, and adherence measurement approaches. Findings were not uniformly positive, while some MDT-based interventions reported significant improvements in adherence,^{52,67,69,80} others showed modest effects, non-significant between-group differences, high adherence in both intervention and control groups, or improvements in clinical outcomes without direct adherence measurement.^{51,54,66,73,78,81–83} These mixed findings suggest that MDT care should be interpreted as a complex model of care in which comparability between studies is difficult to perform.

There were several methodological challenges to consider. Firstly, adherence was measured using a variety of methods, including objective and subjective measures. Self-reported methods are prone to over-estimation,⁸⁴ while objective measures may be more accurate; however, in many of the studies the participants were aware of the monitoring, which may have influenced behavior, potentially explaining improvements observed in control groups.⁵¹ Wide variability in baseline adherence levels across populations and geographic regions further complicates comparisons and the evaluation of intervention effects. Many studies emphasized adherence conceptually but evaluated clinical outcomes such as HbA1c.^{82,83} While improvements in these outcomes may indirectly reflect improved adherence, the presence of other confounders such as lifestyle and dietary changes makes this difficult to confirm. Additionally, intervention groups often receive intensified patient contact, often involving repeated 30-to-60-minute sessions and ongoing follow-up, which may be challenging to implement at scale within routine practice. This limits the interpretation of whether observed improvements are due to MDT care itself or simply increased consultation time. Future studies should explicitly control for consultation frequency and duration to distinguish the independent effect of MDT configuration from the benefits of increased clinical contact alone.

Conclusion

Across the reviewed literature, pharmacist-led interventions, including, medication reviews, reconciliation, side-effect management, and structured follow-up, consistently demonstrated improvements in medication adherence, although effects varied by intervention design and method of adherence measurement. Nurse- and pharmacist-led behavioral interventions, including structured education, motivational interviewing, and action planning, showed modest improvements in objectively measured adherence outcomes.

Psychosocially integrated models of care, incorporating care managers, psychological therapies, and/or social support, appears especially relevant for individuals with comorbid depression or high diabetes distress. These interventions were associated with improvements in adherence-related outcomes and/or clinical markers. Notably, the proportion of individuals achieving good adherence increased from 36% to 65% with the inclusion of care managers in those with depression and T2DM, suggesting this is an important area to consider.

Collectively, these findings support the use of a multifaceted, multidisciplinary team (MDT) approach to addressing medication adherence in T2DM. Given the substantial clinical and health system consequences of medication non-adherence, there is an urgent need to implement patient-centered strategies that provide adequate follow up and alleviate the concerns related to medication use for those with T2DM. This review provides a pragmatic framework (Figure 3) for designing MDT based care teams to address medication adherence in T2DM, which closely aligns with the WHO-MAM model of care (Figure 1). The evidence shows that such strategies can be effectively delivered

through MDT models of care, with multiple healthcare professions working collaboratively to support sustained adherence.

Abbreviations

T2DM, type 2 diabetes mellitus; PDC, proportion of days covered; MARS-5, Medication Adherence Report Scale (5-item); WHO, World Health Organization; WHO-MAM, The World Health Organization Multidimensional Adherence Model; MDT, multidisciplinary team; DAWN, Diabetes, Attitudes, Wishes and Needs; RCT, randomized control trial; MMAS-8, 8-item Morisky Adherence Scale; PRISMA, Proactive Interdisciplinary Self-Management; MPR, medication possession ratio; MEMS, Medication Event Monitoring System.

Data Sharing Statement

No new data were created or analyzed in this article. Data sharing is not applicable to this article.

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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References

1. International Diabetes Federation. *IDF Diabetes Atlas*. 11th ed. Brussels, Belgium: International Diabetes Federation; 2026.
2. Ahmad E, Lim S, Lamptey R, Webb DR, Davies MJ. Type 2 diabetes. *Lancet*. 2022;400(10365):1803–1820.
3. Weir GC, Gaglia J, Bonner-Weir S. Inadequate β -cell mass is essential for the pathogenesis of type 2 diabetes. *Lancet Diabetes Endocrinol*. 2020;8(3):249–256. doi:10.1016/S2213-8587(20)30022-X
4. Khunti K, Kosiborod M, Ray KK. Legacy benefits of blood glucose, blood pressure and lipid control in individuals with diabetes and cardiovascular disease: time to overcome multifactorial therapeutic inertia? *Diabetes Obesity Metab*. 2018;20(6):1337–1341. doi:10.1111/dom.13243
5. Khunti K, Zaccardi F, Amod A, et al. Glycaemic control is still central in the hierarchy of priorities in type 2 diabetes management. *Diabetologia*. 2025;68(1):17–28. doi:10.1007/s00125-024-06254-w
6. 10. Cardiovascular disease and risk management: standards of care in diabetes—2026. *Diabetes Care*. 2026;49(Supplement_1):S216–S245. doi:10.2337/dc26-S010

7. Kacha G, Highton PJ, Funnell MP, et al. Global guideline recommended target achievements in glycaemic, blood pressure, and lipid control in type 2 diabetes: an updated meta-analysis of 1,618,972 participants. *Diabet Res Clin Pract.* **2025**;230:113001. doi:10.1016/j.diabres.2025.113001
8. Moiz A, Filion KB, Tsoukas MA, Yu OH, Peters TM, Eisenberg MJ. The expanding role of GLP-1 receptor agonists: a narrative review of current evidence and future directions. *EClinicalMedicine.* **2025**;86:103363. doi:10.1016/j.eclinm.2025.103363
9. Kluger AY, Tecson KM, Barbin CM, et al. Cardiorenal outcomes in the CANVAS, DECLARE-TIMI 58, and EMPA-REG OUTCOME Trials: a systematic review. *Rev Cardiovasc Med.* **2018**;19(2). doi:10.31083/j.rcm.2018.02.907
10. Berthon W, McGurnaghan SJ, Blackburn LA, et al. Polypharmacy and potentially inappropriate prescribing in people with type 2 diabetes: an analysis of the Scottish Diabetes Research Network national diabetes cohort. *Diabetic Med.* **2025**;e70179.
11. Edelman SV, Polonsky WH. Type 2 diabetes in the real world: the elusive nature of glycemic control. *Diabetes Care.* **2017**;40(11):1425–1432. doi:10.2337/dc16-1974
12. Carls GS, Tuttle E, Tan R, et al. Understanding the gap between efficacy in randomized controlled trials and effectiveness in real-world use of GLP-1 RA and DPP-4 therapies in patients with type 2 diabetes. *Diabetes Care.* **2017**;40(11):1469–1478. doi:10.2337/dc16-2725
13. Cramer JA, Roy A, Burrell A, et al. Medication compliance and persistence: terminology and definitions. *Value Health.* **2008**;11(1):44–47. doi:10.1111/j.1524-4733.2007.00213.x
14. Vrijens B, De Geest S, Hughes DA, et al. A new taxonomy for describing and defining adherence to medications. *Br J Clin Pharmacol.* **2012**;73(5):691–705. doi:10.1111/j.1365-2125.2012.04167.x
15. Loucks J, Zuckerman AD, Berni A, Saulles A, Thomas G, Alonzo A. Proportion of days covered as a measure of medication adherence. *Am J Health Syst Pharm.* **2022**;79(6):492–496. doi:10.1093/ajhp/zxab392
16. Shah KK, Touchette DR, Marrs JC. Research and scholarly methods: measuring medication adherence. *J Am Coll Clin Pharm.* **2023**;6(4):416–426. doi:10.1002/jac5.1771
17. Beernink JM, Oosterwijk MM, Khunti K, et al. Biochemical urine testing of medication adherence and its association with clinical markers in an outpatient population of type 2 diabetes patients: analysis in the DIABetes and LiFestyle Cohort Twente (DIALECT). *Diabetes Care.* **2021**;44(6):1419–1425. doi:10.2337/dc20-2533
18. Nieuwlaet R, Wilczynski N, Navarro T, et al. Interventions for enhancing medication adherence. *Cochrane Database Syst Rev.* **2014**;2014(11).
19. Sabaté E. *Adherence to Long-Term Therapies: Evidence for Action.* World Health Organization; **2003**.
20. Boonpattharathiti K, Songkla PN, Chantara J, et al. Prevalence of adherence to oral antidiabetic drugs in patients with type 2 diabetes: a systematic review and meta-analysis. *J Diabetes Invest.* **2024**;15(11):1614–1625. doi:10.1111/jdi.14285
21. Fischer MA, Stedman MR, Lii J, et al. Primary medication non-adherence: analysis of 195,930 electronic prescriptions. *J Gen Intern Med.* **2010**;25(4):284–290. doi:10.1007/s11606-010-1253-9
22. Raebel MA, Carroll NM, Ellis JL, Schroeder EB, Bayliss EA. Importance of including early nonadherence in estimations of medication adherence. *Ann Pharmacother.* **2011**;45(9):1053–1060. doi:10.1345/aph.1Q146
23. Choe JH, Xuan S, Goldenberg A, Matian J, McCombs J, Kim RE. Medication persistence and its impact on type 2 diabetes. *Am J Manag Care.* **2024**;30(4):e124–e134. doi:10.37765/ajmc.2024.89534
24. Fernández A, Quan J, Moffet H, Parker MM, Schillinger D, Karter AJ. Adherence to newly prescribed diabetes medications among insured Latino and White patients with diabetes. *JAMA Intern Med.* **2017**;177(3):371–379. doi:10.1001/jamainternmed.2016.8653
25. Krapek K, King K, Warren SS, et al. Medication adherence and associated hemoglobin A1c in type 2 diabetes. *Ann Pharmacother.* **2004**;38(9):1357–1362. doi:10.1345/aph.1D612
26. Kennedy-Martin T, Boye KS, Peng X. Cost of medication adherence and persistence in type 2 diabetes mellitus: a literature review. *Patient Prefer Adherence.* **2017**;Volume 11:1103–1117. doi:10.2147/PPA.S136639
27. Simpson SH, Lin M, Eurich DT. Medication adherence affects risk of new diabetes complications: a cohort study. *Ann Pharmacother.* **2016**;50(9):741–746. doi:10.1177/1060028016653609
28. Khunti K, Seidu S, Kunutsor S, Davies M. Association between adherence to pharmacotherapy and outcomes in type 2 diabetes: a meta-analysis. *Diabetes Care.* **2017**;40(11):1588–1596. doi:10.2337/dc16-1925
29. Kim Y, Lee J, Kang H, Park SM. Effect of medication adherence on long-term all-cause-mortality and hospitalization for cardiovascular disease in 65,067 newly diagnosed type 2 diabetes patients. *Sci Rep.* **2018**;8(1):12190.
30. Herborg H, Haugbølle LS, Sørensen L, Rossing C, Dam P. Developing a generic, individualised adherence programme for chronic medication users. *Pharm Pract.* **2008**;6(3):148–157.
31. Ekenberg M, Qvarnström M, Sundström A, Martinell M, Wettermark B. Socioeconomic factors associated with poor medication adherence in patients with type 2 diabetes. *Eur J Clin Pharmacol.* **2024**;80(1):53–63. doi:10.1007/s00228-023-03571-8
32. Hunt J, Rozenfeld Y, Shenolikar R. Effect of patient medication cost share on adherence and glycemic control. *Manag Care.* **2009**;18(7):47–53.
33. Coleman CI, Limone B, Sobieraj DM, et al. Dosing frequency and medication adherence in chronic disease. *J Managed Care Pharm.* **2012**;18(7):527–539. doi:10.18553/jmcp.2012.18.7.527
34. Weeda ER, Muraoka AK, Brock MD, Cannon JM. Medication adherence to injectable glucagon-like peptide-1 (GLP-1) receptor agonists dosed once weekly vs once daily in patients with type 2 diabetes: a meta-analysis. *Int J Clin Pract.* **2021**;75(9):e14060. doi:10.1111/ijcp.14060
35. Davies MJ, Gagliardino JJ, Gray LJ, Khunti K, Mohan V, Hughes R. Real-world factors affecting adherence to insulin therapy in patients with Type 1 or Type 2 diabetes mellitus: a systematic review. *Diabetic Med.* **2013**;30(5):512–524. doi:10.1111/dme.12128
36. Vermeire E, Van Royen P, Coenen S, Wens J, Denekens J. The adherence of type 2 diabetes patients to their therapeutic regimens: a qualitative study from the patient's perspective. *Pract Diabetes Int.* **2003**;20(6):209–214. doi:10.1002/pdi.505
37. Janz NK, Becker MH. The health belief model: a decade later. *Health Educ Q.* **1984**;11(1):1–47. doi:10.1177/109019818401100101
38. Alatawi YM, Kavookjian J, Ekong G, Alrayees MM. The association between health beliefs and medication adherence among patients with type 2 diabetes. *Res Social Adm Pharm.* **2016**;12(6):914–925. doi:10.1016/j.sapharm.2015.11.006
39. Highton PJ, Funnell MP, Gupta P, et al. Improving medication adherence in type 2 diabetes: strategies for better clinical and economic outcomes. *Diabetologia.* **2025**;1–16.
40. Andersen JD, Jensen MH, Vestergaard P, Jensen V, Hejlesen O, Hangaard S. The multidisciplinary team in diagnosing and treatment of patients with diabetes and comorbidities: a scoping review. *J Multimorb Comorb.* **2023**;13:26335565231165966. doi:10.1177/26335565231165966

41. McGill M, Blonde L, Chan JC, Khunti K, Lavalley FJ, Bailey CJ. The interdisciplinary team in type 2 diabetes management: challenges and best practice solutions from real-world scenarios. *J Clin Transl Endocrinol*. 2017;7:21–27. doi:10.1016/j.jcte.2016.12.001
42. Tandan M, Dunlea S, Cullen W, Bury G. Teamwork and its impact on chronic disease clinical outcomes in primary care: a systematic review and meta-analysis. *Public Health*. 2024;229:88–115. doi:10.1016/j.puhe.2024.01.019
43. Nurchis MC, Sessa G, Pascucci D, Sassano M, Lombi L, Damiani G. Interprofessional collaboration and diabetes management in primary care: a systematic review and meta-analysis of patient-reported outcomes. *J Pers Med*. 2022;12(4):643. doi:10.3390/jpm12040643
44. Levensgood TW, Peng Y, Xiong KZ, et al. Team-based care to improve diabetes management: a community guide meta-analysis. *Am J Prev Med*. 2019;57(1):e17–e26. doi:10.1016/j.amepre.2019.02.005
45. Nicolucci A, Kovacs Burns K, Holt RI, et al. Diabetes Attitudes, Wishes and Needs second study (DAWN2™): cross-national benchmarking of diabetes-related psychosocial outcomes for people with diabetes. *Diabetic Med*. 2013;30(7):767–777. doi:10.1111/dme.12245
46. Rubin RR, Peyrot M, Siminerio LM; International DAWN Advisory Panel. Health care and patient-reported outcomes: results of the cross-national Diabetes Attitudes, Wishes and Needs (Dawn) study. *Diabetes Care*. 2006;29(6):1249–1255. doi:10.2337/dc05-2494
47. Peyrot M, Rubin RR, Lauritzen T, Snoek FJ, Matthews DR, Skovlund S. Psychosocial problems and barriers to improved diabetes management: results of the Cross-National Diabetes Attitudes, Wishes and Needs (Dawn) Study. *Diabetic Med*. 2005;22(10):1379–1385. doi:10.1111/j.1464-5491.2005.01644.x
48. Schwartz DD, Stewart SD, Aikens JE, Bussell JK, Osborn CY, Safford MM. Seeing the person, not the illness: promoting diabetes medication adherence through patient-centered collaboration. *Clin Diabetes*. 2017;35(1):35–42. doi:10.2337/cd16-0007
49. McGill M, Felton A. New global recommendations: a multidisciplinary approach to improving outcomes in diabetes. *Prim Care Diabetes*. 2007;1(1):49–55. doi:10.1016/j.pcd.2006.07.004
50. Cai J, Islam MS. Interventions incorporating a multi-disciplinary team approach and a dedicated care team can help reduce preventable hospital readmissions of people with type 2 diabetes mellitus: a scoping review of current literature. *Diabetic Med*. 2023;40(1):e14957. doi:10.1111/dme.14957
51. Pao J, Wu S, Guo Y, Huang W. Evaluating pharmacist-driven interventions in multidisciplinary diabetes care: a quasi-experimental study. *Sci Diabetes Self Manag Care*. 2025;51(5):462–475. doi:10.1177/26350106251361368
52. Ebid AI, Mobarez MA, Ramadan RA, Mahmoud MA. Impact of a clinical pharmacist intervention program on the follow-up of type-2 diabetic patients. *Hosp Pharm*. 2022;57(1):76–82. doi:10.1177/0018578720973881
53. Farmer A, Hardeman W, Hughes D, et al. An explanatory randomised controlled trial of a nurse-led, consultation-based intervention to support patients with adherence to taking glucose lowering medication for type 2 diabetes. *BMC Fam Pract*. 2012;13(1):30. doi:10.1186/1471-2296-13-30
54. du Pon E, El Azzati S, van Dooren A, Kleefstra N, Heerdink E, van Dulmen S. Effects of a proactive interdisciplinary self-management (PRISMA) program on medication adherence in patients with type 2 diabetes in primary care: a randomized controlled trial. *Patient Prefer Adherence*. 2019;13:749–759. doi:10.2147/PPA.S188703
55. Wilhelmsen NC, Eriksson T. Medication adherence interventions and outcomes: an overview of systematic reviews. *Eur J Hosp Pharm*. 2019;26(4):187–192. doi:10.1136/ejpharm-2018-001725
56. Celio J, Ninane F, Bugnon O, Schneider MP. Pharmacist-nurse collaborations in medication adherence-enhancing interventions: a review. *Patient Educ Couns*. 2018;101(7):1175–1192. doi:10.1016/j.pec.2018.01.022
57. Sapkota S, Brien J, Greenfield J, Aslani P. A systematic review of interventions addressing adherence to anti-diabetic medications in patients with type 2 diabetes—impact on adherence. *PLoS One*. 2015;10(2):e0118296. doi:10.1371/journal.pone.0118296
58. Wens J, Vermeire E, Van Royen P, Sabbe B, Denekens J. GPs' perspectives of type 2 diabetes patients' adherence to treatment: a qualitative analysis of barriers and solutions. *BMC Fam Pract*. 2005;6(1):20. doi:10.1186/1471-2296-6-20
59. Berkowitz SA, Eisenstat SA, Barnard LS, Wexler DJ. Multidisciplinary coordinated care for Type 2 diabetes: a qualitative analysis of patient perspectives. *Prim Care Diabetes*. 2018;12(3):218–223. doi:10.1016/j.pcd.2018.01.005
60. Beverly EA, Ritholz MD, Brooks KM, et al. A qualitative study of perceived responsibility and self-blame in type 2 diabetes: reflections of physicians and patients. *J Gen Intern Med*. 2012;27(9):1180–1187. doi:10.1007/s11606-012-2070-0
61. Chen C, Tseng C, Cheng S. Continuity of care, medication adherence, and health care outcomes among patients with newly diagnosed type 2 diabetes: a longitudinal analysis. *Med Care*. 2013;51(3):231–237. doi:10.1097/MLR.0b013e31827da5b9
62. Yarnall KS, Pollak KI, Østbye T, Krause KM, Michener JL. Primary care: is there enough time for prevention? *Am J Public Health*. 2003;93(4):635–641. doi:10.2105/AJPH.93.4.635
63. Presley B, Groot W, Pavlova M. Pharmacy-led interventions to improve medication adherence among adults with diabetes: a systematic review and meta-analysis. *Res Social Adm Pharm*. 2019;15(9):1057–1067. doi:10.1016/j.sapharm.2018.09.021
64. Carter M, Chapman S, Rogers P, Watson M. Practice pharmacists and their influence on prescribing in UK general practice: a cross-sectional study. *Int J Pharm Pract*. 2024;32(1):69–75. doi:10.1093/ijpp/riad075
65. Antoine S, Pieper D, Mathes T, Eikermann M. Improving the adherence of type 2 diabetes mellitus patients with pharmacy care: a systematic review of randomized controlled trials. *BMC Endocr Disord*. 2014;14(1):53. doi:10.1186/1472-6823-14-53
66. Bandiera C, Dotta-Celio J, Locatelli I, et al. The differential impact of a 6-versus 12-month pharmacist-led interprofessional medication adherence program on medication adherence in patients with diabetic kidney disease: the randomized PANDIA-IRIS study. *Front Pharmacol*. 2024;15:1294436. doi:10.3389/fphar.2024.1294436
67. Erku DA, Ayele AA, Mekuria AB, Belachew SA, Hailemeskel B, Tegegn HG. The impact of pharmacist-led medication therapy management on medication adherence in patients with type 2 diabetes mellitus: a randomized controlled study. *Pharm Pract*. 2017;15(3):1026. doi:10.18549/PharmPract.2017.03.1026
68. Benson GA, Sidebottom A, Hayes J, et al. Impact of ENHANCED (diEtitiaNs Helping pAtieNts CarE for Diabetes) telemedicine randomized controlled trial on diabetes optimal care outcomes in patients with type 2 diabetes. *J Acad Nutr Diet*. 2019;119(4):585–598. doi:10.1016/j.jand.2018.11.013
69. Aguiar PM, da Silva CHP, Chiann C, Dórea EL, Lyra DP, Storpirtis S. Pharmacist–physician collaborative care model for patients with uncontrolled type 2 diabetes in Brazil: results from a randomized controlled trial. *J Eval Clin Pract*. 2018;24(1):22–30. doi:10.1111/jep.12606
70. Harwell TS, Dettori N, McDowall JM, et al. Do persons with diabetes know their (A1C) number? *Diabetes Educ*. 2002;28(1):99–105. doi:10.1177/014572170202800111

71. Heisler M, Piette JD, Spencer M, Kieffer E, Vijan S. The relationship between knowledge of recent HbA1c values and diabetes care understanding and self-management. *Diabetes Care*. 2005;28(4):816–822. doi:10.2337/diacare.28.4.816
72. Lautsch D, Boggs R, Wang T, et al. Individualized HbA1c goals, and patient awareness and attainment of goals in type 2 diabetes mellitus: a real-world multinational survey. *Adv Ther*. 2022;39(2):1016–1032. doi:10.1007/s12325-021-01985-3
73. Garrison TA, Schwartz JK, Moore ES. Effect of occupational therapy in promoting medication adherence in primary care: a randomized controlled trial. *Am J Occup Ther*. 2023;77(3):7703205040. doi:10.5014/ajot.2023.050109
74. Farooqi A, Gillies C, Sathanapally H, et al. A systematic review and meta-analysis to compare the prevalence of depression between people with and without Type 1 and Type 2 diabetes. *Prim Care Diabetes*. 2022;16(1):1–10. doi:10.1016/j.pcd.2021.11.001
75. Perrin NE, Davies MJ, Robertson N, Snoek FJ, Khunti K. The prevalence of diabetes-specific emotional distress in people with Type 2 diabetes: a systematic review and meta-analysis. *Diabetic Med*. 2017;34(11):1508–1520. doi:10.1111/dme.13448
76. Gonzalez JS, Kane NS, Binko DH, Shapira A, Hoogendoorn CJ. Tangled up in blue: unraveling the links between emotional distress and treatment adherence in type 2 diabetes. *Diabetes Care*. 2016;39(12):2182–2189. doi:10.2337/dc16-1657
77. Kwakye AO, Larry-Afutu JA, Kretchy IA. Key drivers of medication adherence in patients with comorbid diabetes mellitus and depression: a scoping review. *J Pharm Pract Res*. 2025;55:351–364. doi:10.1002/jppr.70016
78. Doherty AM, Gayle C, Morgan-Jones R, et al. Improving quality of diabetes care by integrating psychological and social care for poorly controlled diabetes: 3 Dimensions of Care for Diabetes. *Int J Psychiatry Med*. 2016;51(1):3–15. doi:10.1177/0091217415621040
79. Vieira JFF, Santos P. Medication adherence in type 2 diabetes mellitus patients: a cross-sectional study. *Rev Port Med Geral Fam*. 2020;36(2):104–112. doi:10.32385/rpmgf.v36i2.12395
80. Bogner HR, Morales KH, de Vries HF, Cappola AR. Integrated management of type 2 diabetes mellitus and depression treatment to improve medication adherence: a randomized controlled trial. *Anna Family Med*. 2012;10(1):15–22. doi:10.1370/afm.1344
81. Benson G, Hayes J, Bunkers-Lawson T, Sidebottom A, Boucher J. Leveraging registered dietitian nutritionists and registered nurses in medication management to reduce therapeutic inertia. *Diabetes Spectr*. 2022;35(4):491–503. doi:10.2337/ds21-0104
82. Talavera GA, Castañeda SF, Mendoza PM, et al. Latinos understanding the need for adherence in diabetes (LUNA-D): a randomized controlled trial of an integrated team-based care intervention among Latinos with diabetes. *Transl Behav Med*. 2021;11(9):1665–1675. doi:10.1093/tbm/ibab052
83. Farsaei S, Sabzghabae AM, Zargarzadeh AH, Amini M. Effect of pharmacist-led patient education on glycemic control of type 2 diabetics: a randomized controlled trial. *J Res Med Sci*. 2011;16(1):43.
84. Liao R, Tang Z, Zhang N, et al. Discrepancies between self-reported medication in adherence and indirect measurement adherence among patients undergoing antiretroviral therapy: a systematic review. *Infect Dis Poverty*. 2024;13(04):1–13. doi:10.1186/s40249-024-01221-4

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