



The Role of Nurse-Led Patient Education in Improving Diabetes Self-Management and Clinical Outcomes

Elena Maren Whitfield

Centre for Nursing Education and Chronic Disease Research, Bristol, United Kingdom

Abstract

Diabetes self-management depends on repeated decisions about food, medicines, activity, monitoring, and responses to changing symptoms. Patient education can help people make these decisions, but information alone rarely resolves the practical and emotional difficulties of living with a chronic condition. This narrative review examines how nurse-led patient education can strengthen diabetes self-management and support clinical outcomes, principally among adults with type 2 diabetes. Twelve selected publications, including trials, evidence syntheses, and professional consensus documents, provide the evidence base; no new participants were recruited and no original clinical dataset was analyzed. The discussion considers educational assessment, collaborative goal setting, practical skills, psychosocial support, cultural adaptation, digital delivery, and service evaluation. Published evidence generally supports structured diabetes education, while nurse-led interventions offer a practical means of connecting learning with continuing care. However, intervention content, professional responsibilities, treatment changes, and follow-up differ substantially, limiting attribution of benefit to education or nursing leadership alone. Glycated hemoglobin is a useful outcome, but patient understanding, hypoglycemia, distress, treatment burden, and equitable access also require attention. A graph reproduces descriptive summary values from a published education review rather than simulated patient results, and a table maps educational activities to appropriate measures. Nurse-led education is most defensible as a continuing, person-centered process embedded within coordinated clinical care. Its value depends on educational competence, clear escalation pathways, accessible resources, and evaluation that measures both benefit and unintended burden.

Keywords: Nurse-led education, Diabetes self-management, Glycemic control, Patient empowerment, Clinical outcomes

INTRODUCTION

Living with diabetes involves considerably more than following instructions issued during a clinic appointment. People must interpret their treatment plans in circumstances shaped by employment, family responsibilities, income, access to food, and experiences of illness. A recommendation that appears straightforward in a consulting room may become difficult when a person works irregular shifts, cannot afford monitoring supplies, or fears an injection. The central educational challenge is therefore to connect clinical recommendations with decisions that are understandable, feasible, and safe in everyday life. Nurses occupy an important position in this process because education can be incorporated into assessment, treatment preparation, follow-up, and coordination across services. Nursing leadership means taking responsibility for organizing and adapting learning, checking understanding, and responding to unresolved needs. It does not mean that nurses replace other professionals or independently undertake activities outside

their competence. Effective programs depend on collaboration with prescribers, dietitians, pharmacists, behavioral health professionals, and community services. The relevant question is how nurses can make this collaboration useful to the person managing diabetes. The evidence examined here includes structured education trials and research specifically involving nurse-led delivery. These bodies of evidence overlap but are not interchangeable. DESMOND and X-PERT illustrate structured approaches to type 2 diabetes education; DAFNE provides a separate example for type 1 diabetes and intensive insulin management (Davies et al., 2008; Dakin et al., 2006; DAFNE Study Group, 2002). Findings from such programs help explain educational design without establishing that every outcome results from nursing leadership. Maintaining this distinction prevents overstatement and clarifies what future evaluations must measure. This article develops a practice-oriented interpretation of selected literature. Its main argument is that nurse-led education can support better self-management when it combines practical learning with continuing relationships, appropriate clinical review, and attention to access. The following nine sections examine the evidence and propose ways to translate it into educational practice. Recommendations about service design are interpretations offered for local evaluation, rather than findings from a newly tested intervention.

Evidence Base and Scope of the Narrative Review:

This manuscript uses a selective narrative approach rather than a systematic review or meta-analysis. Published trials, reviews, and consensus statements were chosen for their relevance to adult diabetes education, nursing delivery, communication, and implementation. The reference set includes foundational educational studies alongside later professional standards and evidence concerning web-based nursing interventions. It is intended to explain mechanisms and practical choices, not to provide an exhaustive account of every intervention published before a specified date. No registered protocol, duplicate screening process, or formal risk-of-bias assessment was undertaken. Three questions guide the interpretation. The first concerns whether structured education improves outcomes compared with routine care. The second concerns what nurse-led delivery adds through contact, assessment, feedback, or coordination? The third concerns whether a program can reach people whose circumstances make attendance and self-care difficult. These questions require different evidence. Randomization can strengthen causal inference about a complete program, while an observational association between literacy and outcomes cannot demonstrate that a particular teaching technique will correct that association. The review also distinguishes education from treatment intensification. A nurse-led service may include medication review, prescribing under an authorized arrangement, monitoring, or referral. If outcomes improve, education may be one contributor among several. Likewise, additional appointment time may help independently of professional designation. Niue et al. (2021) evaluated nurse-led web-based interventions and found improvements in several clinical measures, but the bundled nature of such programs limits conclusions about individual components. The interpretation here therefore favors describing the intervention and its context rather than attributing all improvement to one professional role. Generalizability deserves equal attention. Studies involving motivated volunteers, well-resourced clinics, or participants with reliable internet access may not represent people who face unstable housing, disability, language barriers, or fragmented care. Evidence from adults with type 2 diabetes should not automatically determine education for pregnancy, childhood diabetes, or type 1 diabetes. The article uses those boundaries throughout. Its proposed service activities should be adapted to local competencies and evaluated before broader implementation, particularly where staffing, referral systems, and access to essential supplies differ from the research settings.

Theoretical Foundations and Pathways to Self-Management:

The practical purpose of education is to strengthen a person's capacity to act, rather than to increase factual recall alone. Knowledge can explain why a treatment matters, but capability also requires skills, confidence, opportunity, and permission to ask questions. A person may understand that monitoring is useful yet be unable to operate a device, interpret its display, or purchase the supplies. An educational assessment should therefore examine what the person can do in context, not simply what the person can repeat after a lesson. Self-efficacy offers one useful explanation of how learning may translate into action. Successfully demonstrating a manageable task can increase confidence in repeating it at home. Nurses can support this process by breaking a complex activity into smaller steps, allowing practice, and providing specific feedback. Instead of praising a patient vaguely for doing well, the educator can identify the action

performed accurately and ask which step remains uncertain. This creates information that both participants can use at the next encounter and avoids treating confidence as a substitute for demonstrated competence. Collaborative goal setting provides another pathway. Broad intentions such as improving diet are difficult to assess and may conceal competing priorities. An agreed goal should describe an action the person considers relevant, a realistic opportunity to attempt it, and a time for review. The nurse then explores what happened without assuming that failure reflects indifference. A missed goal may reveal pain, food insecurity, unpredictable work, or an unsuitable treatment plan. Learning becomes an iterative process in which the plan changes as the person's circumstances become clearer. These mechanisms should be evaluated rather than assumed. A program might improve confidence without changing clinical outcomes, or improve glycaemia through medication changes while leaving the person overwhelmed. Measuring understanding, practical competence, and perceived burden alongside clinical indicators helps identify such differences. The theoretical interpretation proposed here is that educational contact is most likely to help when it connects explanation with practice and feedback. Repeated information without an opportunity to use it may produce attendance records and completed worksheets while leaving the underlying self-management difficulty unresolved.

Individual Assessment and Collaborative Educational Planning:

An initial nursing assessment should establish what diabetes means to the person and which decisions currently feel difficult. Useful opening topics include the person's treatment routine, previous educational experiences, concerns about complications, and preferred language. Asking someone to describe an ordinary day often reveals more than a checklist of prescribed behaviors. The nurse can then explore where medicines, meals, activity, sleep, and monitoring fit into that day, and which demands compete for attention. This information creates a basis for selecting a small number of meaningful educational priorities. Health literacy should be treated as a communication responsibility shared by the service. Schilling et al. (2002) identified an association between limited health literacy and poorer diabetes outcomes, but the observational design does not establish a simple causal chain. A practical response is to reduce unnecessary complexity for everyone while offering additional help when needed. Written materials should use familiar language, readable layouts, and clear explanations of numbers. Professional interpreters, accessible formats, and appropriate support for sensory impairment can improve the conditions for learning without labeling patients as deficient. Teach-back provides a way to check whether an explanation was clear. The educator asks the person to describe the agreed plan in their own words, framing the exercise as a check on the explanation rather than a test of intelligence. Yen and Leisure (2019) support its use for reinforcing and confirming education, while the diversity of included settings limits claims about diabetes-specific clinical effects. In practice, teach-back is particularly valuable when misunderstandings could lead to unsafe action. Demonstration should complement verbal explanation when the task involves a device or physical technique. Planning should conclude with an agreed record of priorities, responsibilities, and follow-up. That record should distinguish what the patient plans to attempt from what the clinical team must arrange. For example, an educational goal may depend on obtaining a suitable device or resolving inconsistent prescriptions. Documenting those dependencies prevents the service from transferring responsibility for system failures to the patient. A useful plan is brief enough to consult at home, specific enough to guide action, and flexible enough to change after illness, treatment adjustment, or a major change in daily circumstances.

Core Educational Content and Practical Nursing Methods:

Educational content should reflect the person's diabetes type, treatment, existing knowledge, and immediate risks. A generic curriculum can provide structure, but the order and depth of topics need adaptation. Early sessions may prioritize understanding medicines and recognizing situations that require help, while later encounters can explore patterns, confidence, and longer-term prevention. The nurse should explain why each topic matters and invite questions before adding more information. Completing every curriculum item during a single encounter may be less useful than establishing competence in a few essential tasks. Medication education should connect the actual medicine supplied with its prescribed purpose and instructions. Patients should have an opportunity to compare labels, devices, and written plans and identify discrepancies. Education about injections can include supervised practice with appropriate teaching

equipment, checking technique, storage instructions, and disposal arrangements. Changes in dose or timing require individualized clinical guidance within an authorized professional scope. The educational objective is safe understanding of the agreed regimen and confidence in seeking clarification, rather than encouraging unsupervised treatment changes based on general advice. Food and activity discussions should begin with existing habits and available resources. Nurses can help people identify achievable changes while referring for individualized nutrition or rehabilitation input when required. Education should avoid presenting unfamiliar foods, expensive products, or rigid schedules as necessary conditions for successful self-management. Similarly, monitoring education should address why testing has been recommended, how to perform it accurately, how results are recorded, and what action the clinical team has agreed. More measurements are not automatically useful when the person lacks a clear interpretation and response plan. Practical teaching also includes preparation for disruptions. The person should know where to obtain individualized advice during illness, medication problems, travel, or changes in appetite and activity. Safety instructions should be specific to the treatment plan, including the locally agreed response to possible hypoglycemia and other urgent symptoms. Nurses can rehearse short scenarios and ask the patient to identify whom to contact. The table below summarizes proposed educational activities and suitable measures. It is a practice framework for evaluation, not a report of observed patient outcomes.

Table 1 Proposed educational activities and evaluation measures

Educational priority	Nursing activity	Evaluation measure
Understanding the plan	Plain-language explanation and teach-back	Accurate explanation in the patient's own words
Medicine and device skills	Supervised demonstration and practice	Observed technique; unresolved discrepancies
Daily routines	Agree one feasible action and review barriers	Goal progress and patient-reported burden
Safety and help-seeking	Rehearse the individualized response plan	Scenario response; hypoglycemia events
Emotional support	Discuss concerns and arrange relevant referral	Distress assessment and completed follow-up
Access and continuity	Offer suitable contact methods and coordinate care	Participation, retention, and referral completion

Effects on Glycemic Control and Clinical Outcomes:

Clinical evaluation should separate a change in average glycaemia from a claim about overall health benefit. HbA1c summarizes an important aspect of longer-term glucose exposure, but it does not describe every episode of hypoglycemia, every daily fluctuation, or the burden of achieving a target. Its interpretation also depends on clinical circumstances. Nurse-led programs should therefore establish how laboratory results will be reviewed alongside symptoms, treatment changes, and patient priorities. A favorable average result should prompt discussion of how it was achieved, rather than ending the evaluation. Chrvala et al. (2016) reviewed 118 distinct diabetes education interventions. Their descriptive summary reported mean HbA1c reductions of 0.74 percentage points in intervention groups and 0.17 in control groups, a difference of 0.57 percentage points. The embedded graph displays those two published values. These are summary reductions across heterogeneous studies, not results from a new trial or a nurse-only comparison. No confidence intervals are added because the graph reproduces the reported descriptive values rather than calculating a new pooled estimate. The figure supports the broader educational rationale while preserving the limits of attribution.

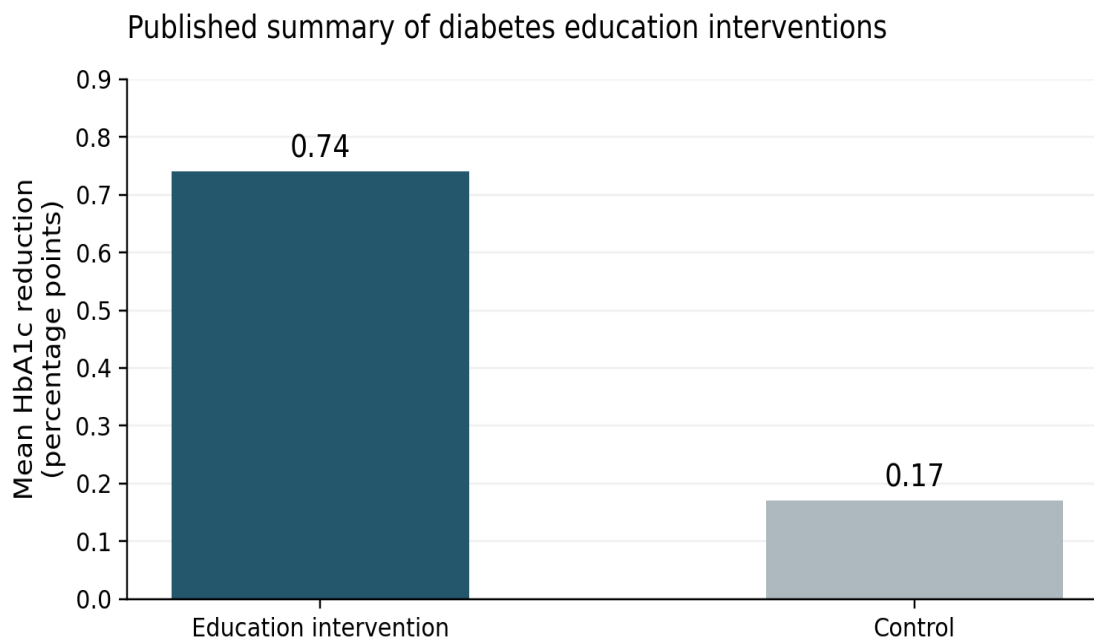


Figure 1 Mean HbA1c reductions reported by Cheval et al. (2016). Descriptive values across heterogeneous education studies; not nurse-specific results. Difference: 0.57 percentage points. No new pooled analysis was performed.

Psychosocial Well-Being and Family Participation:

Diabetes can become emotionally demanding when daily effort appears disconnected from laboratory results or when patients experience repeated criticism. Educational encounters may inadvertently worsen this burden if they frame every result as a judgment of character. Nurses can create a more useful conversation by asking how the person feels about treatment, which demands are hardest, and what kinds of support would help. Acknowledging difficulty does not remove clinical responsibility; it makes the barriers to safe self-management available for discussion and possible resolution. Psychosocial support should include recognition of the limits of an educator's role. A nurse may offer a supportive conversation and help the person identify manageable priorities, but persistent distress, suspected depression, or other mental health concerns may require further assessment and referral. Services should establish pathways before screening so that identified needs lead to a meaningful response. Educational materials alone cannot resolve every emotional problem. Evaluation should also ask whether patients feel more understood and capable after contact, rather than assuming that improved knowledge represents improved well-being. Family involvement can be helpful when it reflects the patient's preferences. Another household member may prepare meals, help obtain medicines, or notice difficulties that the patient wishes to discuss. With consent, the nurse can clarify useful forms of assistance and correct misunderstandings shared by the household. However, relatives can also create conflict, monitor behavior intrusively, or dominate decisions. The educator should preserve opportunities for private discussion and distinguish supportive participation from control. Adults remain entitled to decide how much personal information they wish to share. A practical approach is to agree a specific family role and review whether it helps. Assistance might involve keeping an appointment record, learning how to use agreed emergency contacts, or supporting a chosen household change. The patient should be asked directly whether the arrangement reduces effort or increases pressure. Type 1 diabetes evidence, including DAFNE, demonstrates the relevance of structured skills education to quality of life as well as biomedical outcomes, but its insulin-focused curriculum cannot be transferred wholesale to type 2 diabetes (DAFNE Study Group, 2002). Psychosocial support likewise requires attention to treatment context.

Cultural Adaptation Health Literacy and Equitable Access:

Cultural adaptation requires more than translating a standard leaflet. Food practices, family decision-making, beliefs about medicines, and experiences of healthcare may affect how recommendations are interpreted. Nurses should ask about those influences rather than infer them from ethnicity, clothing, or

language. A person's preferences may differ substantially from those assumed for a particular community. The educational task is to understand the individual and the household environment while retaining accurate clinical content. Community consultation can help services identify recurring barriers without turning cultural categories into fixed explanations of behavior. Attridge et al. (2014) found that culturally appropriate education could improve glycemic outcomes in ethnic minority populations with type 2 diabetes. This supports adaptation, but it does not identify one universally effective package. Local development should include testing whether translated explanations are understood and whether examples reflect affordable, familiar choices. Religious practices, including fasting, may create questions that require advance individualized clinical advice. Nurses should facilitate that discussion with the responsible team rather than offer a generic assurance that the same plan is suitable for everyone. Literacy-sensitive care also involves numeracy, navigation, and the way services communicate. Cavanaugh et al. (2009) evaluated approaches addressing literacy and numeracy within enhanced diabetes care. For practice, the relevant question is whether people can use the information when making a decision. Appointment instructions, prescription changes, and monitoring plans should be checked for ambiguity. A person may read fluently yet find changing units, overlapping instructions, or unfamiliar abbreviations confusing. Staff should review communication failures as possible defects in service design rather than automatically documenting nonadherence. Access must be assessed beyond attendance. Transport costs, lost wages, childcare, disability, and fear of judgment may prevent participation in an otherwise well-designed program. Services can explore flexible timing, local delivery, interpreter support, and alternatives to digital contact. These options should be assessed against actual uptake and completion across population groups. Counting the total number educated can conceal persistent exclusion. An equitable program should examine who was offered education, who could participate, who left early, and whether the resulting care plan was feasible with the resources available to each person.

Digital Delivery Continuity and Interprofessional Coordination:

Digital education can extend contact through telephone calls, video appointments, secure messaging, or structured learning materials. Its value depends on what the contact enables. A reminder may support attendance, while a conversation may uncover an unsafe misunderstanding that a video cannot detect. Nurses should match the channel to the task and the person's preferences, ensuring that privacy, accessibility, and opportunities for clarification are considered. Digital delivery should be understood as a method of providing education and follow-up, not as an intervention that is effective simply because it uses technology. Niu et al. (2021) synthesized nurse-led web-based interventions and reported improvements in HbA1c and selected cardiovascular risk measures. These findings support further implementation work, while differences in platforms and intervention components limit predictions for a specific service. Before adopting a platform, teams should define who reviews messages, how often information is checked, and how urgent concerns are handled. Patients should know whether a channel is continuously monitored. A system that collects information without assigning responsibility for response can increase uncertainty despite creating an appearance of close follow-up. Continuity requires a record that connects educational progress with clinical decisions. Relevant information includes the patient's stated goals, demonstrated skills, unresolved questions, and arrangements for review. Documentation should avoid lengthy copied descriptions that conceal the current issue. A concise record can help the next professional understand what has already been tried and what remains difficult. When treatment changes, the team should check whether the educational plan also needs revision. Advice that was appropriate for a previous regimen may become confusing or unsafe when instructions change without coordinated explanation. Interprofessional working should make responsibilities visible to patients as well as staff. A nurse may coordinate learning while a dietitian provides specialist nutrition care, a pharmacist resolves medicine discrepancies, and a prescriber evaluates treatment. Referral should include a clear question and a mechanism for communicating the response. The consensus report by Powers et al. (2020) supports attention to education at diagnosis, during ongoing review, when complicating factors arise, and around transitions in care. These moments provide opportunities to reconnect learning with the person's changing needs rather than treating course completion as a permanent endpoint.

Implementation Evaluation and Future Research Priorities:

Implementation should begin with a defined population, a manageable curriculum, and a clear account of what nurses are expected and authorized to do. Educational competence includes communication, assessment, practical demonstration, and recognition of problems requiring escalation. Services should allocate time for preparation, documentation, follow-up, and staff development rather than counting only direct teaching minutes. The 2022 National Standards emphasize quality and person-centered DSMES services (Davis et al., 2022). Local adoption requires translating those principles into staffing arrangements and processes that can function consistently under ordinary workload conditions. Evaluation should distinguish reach, delivery, learning, behavior, and clinical outcomes. Reach describes whether eligible people received an offer and could participate. Delivery concerns whether the planned educational activities occurred. Learning examines understanding and practical capability. Behavioral measures address agreed actions, while clinical measures assess health-related change. No single metric adequately represents all these domains. Teams should also record treatment adjustments and additional professional contact, since these can explain clinical improvement. Patient interviews or brief feedback can reveal burdens and misunderstandings that a laboratory result or satisfaction score may overlook. A credible evaluation plan specifies when outcomes will be measured and how missing information will be handled. Comparing only participants who complete every session can exaggerate success if those experiencing the greatest difficulties leave early. Baseline differences, regression toward the mean and concurrent treatment changes also complicate simple before-and-after comparisons. Where feasible, stronger designs can compare services or phased implementation while preserving access to routine care. Cost evaluation should include staffing, equipment, interpretation, patient time, and follow-up activity. Reduced expenditure should be demonstrated rather than inferred automatically from improved self-management scores. Future research should describe educational content and nursing responsibilities in enough detail for replication. Studies should examine durability, unintended burden, equity, and patient-defined benefit alongside glycemic outcomes. Comparisons of delivery methods need to establish whether differences arise from the technology, contact time, professional expertise, or treatment intensification. Pragmatic studies involving people with language barriers, multimorbidity, and limited resources would improve relevance to routine practice. Research partnerships should include patients when selecting outcomes so that programs are judged partly by whether they make every day diabetes management more understandable and manageable.

Summary:

Nurse-led patient education can connect diabetes knowledge with the practical work of self-management. Its strongest rationale lies in individualized assessment, skills practice, collaborative goals, continuing feedback, and coordination with the wider clinical team. Selected research supports structured education and nurse-led delivery, but the evidence does not justify a single guaranteed effect or unrestricted attribution of program outcomes to nurses. The graph summarizes published evidence for education broadly and should not be read as a nurse-specific treatment estimate. Effective services should evaluate whether patients understand and can use their plans, whether clinical outcomes improve safely, and whether participation is equitable. They should also recognize that medicine costs, inaccessible services, and emotional strain cannot be solved by information alone. Nursing education is most useful when unresolved barriers trigger a practical response from the service. Future evaluations should combine credible comparison methods with meaningful patient outcomes and transparent descriptions of intervention content. This approach supports an evidence-informed role for nurses while preserving the distinctions between education, clinical treatment, and the wider conditions required for sustained diabetes care.

References:

- Astride, M., Creamer, J., Ramsden, M., Canings-John, R., & Hawthorne, K. (2014). Culturally appropriate health education for people in ethnic minority groups with type 2 diabetes mellitus. *Cochrane Database of Systematic Reviews*, (9), CD006424. <https://doi.org/10.1002/14651858.CD006424.pub3>
- Cavanaugh, K., Wellston, K. A., Gebretsadik, T., Shintani, A., Huizinga, M. M., Davis, D., Gregory, R. P., Malone, R., Pignone, M., DeWalt, D. A., Elasy, T. A., & Rothman, R. L. (2009). Addressing literacy and numeracy to improve diabetes care: Two randomized controlled trials. *Diabetes Care*, 32(12), 2149–2155. <https://doi.org/10.2337/dc09-0563>

- Chrvala, C. A., Sherr, D., & Lipman, R. D. (2016). Diabetes self-management education for adults with type 2 diabetes mellitus: A systematic review of the effect on glycemic control. *Patient Education and Counseling*, 99(6), 926–943. <https://doi.org/10.1016/j.pec.2015.11.003>
- DAFNE Study Group. (2002). Training in flexible, intensive insulin management to enable dietary freedom in people with type 1 diabetes: Dose adjustment for normal eating (DAFNE) randomised controlled trial. *BMJ*, 325(7367), 746. <https://doi.org/10.1136/bmj.325.7367.746>
- Davies, M. J., Heller, S., Skinner, T. C., Campbell, M. J., Carey, M. E., Craddock, S., Dallosso, H. M., Daly, H., Doherty, Y., Eaton, S., Fox, C., Oliver, L., Rantell, K., Rayman, G., & Khunti, K. (2008). Effectiveness of the diabetes education and self management for ongoing and newly diagnosed (DESMOND) programme for people with newly diagnosed type 2 diabetes: Cluster randomised controlled trial. *BMJ*, 336(7642), 491–495. <https://doi.org/10.1136/bmj.39474.922025.BE>
- Davis, J., Fischl, A. H., Beck, J., Browning, L., Carter, A., Condon, J. E., Dennison, M., Francis, T., Hughes, P. J., Jaime, S., Lau, K. H. K., McArthur, T., McAvoy, K., Magee, M., Newby, O., Ponder, S. W., Quraishi, U., Rawlings, K., Socke, J., ... Villalobos, S. (2022). 2022 National Standards for Diabetes Self-Management Education and Support. *Diabetes Care*, 45(2), 484–494. <https://doi.org/10.2337/dc21-2396>
- Deakin, T. A., Cade, J. E., Williams, R., & Greenwood, D. C. (2006). Structured patient education: The diabetes X-PERT Programme makes a difference. *Diabetic Medicine*, 23(9), 944–954. <https://doi.org/10.1111/j.1464-5491.2006.01906.x>
- Niu, X.-D., Chi, J.-T., Guo, J.-B., Ruan, H.-H., Zhang, J., Tao, H.-X., & Wang, Y.-H. (2021). Effects of nurse-led web-based interventions on people with type 2 diabetes mellitus: A systematic review and meta-analysis. *Journal of Telemedicine and Telecare*, 27(5), 269–279. <https://doi.org/10.1177/1357633X211010019>
- Powers, M. A., Bardsley, J. K., Cypress, M., Funnell, M. M., Harms, D., Hess-Fischl, A., Hooks, B., Isaacs, D., Mandel, E. D., Maryniuk, M. D., Norton, A., Rinker, J., Siminerio, L. M., & Uelman, S. (2020). Diabetes self-management education and support in adults with type 2 diabetes: A consensus report of the American Diabetes Association, the Association of Diabetes Care & Education Specialists, the Academy of Nutrition and Dietetics, the American Academy of Family Physicians, the American Academy of PAs, the American Association of Nurse Practitioners, and the American Pharmacists Association. *Diabetes Care*, 43(7), 1636–1649. <https://doi.org/10.2337/dci20-0023>
- Schillinger, D., Grumbach, K., Piette, J., Wang, F., Osmond, D., Daher, C., Palacios, J., Sullivan, G. D., & Bindman, A. B. (2002). Association of health literacy with diabetes outcomes. *JAMA*, 288(4), 475–482. <https://doi.org/10.1001/jama.288.4.475>
- Steinsbekk, A., Rygg, L. Ø., Lisulo, M., Rise, M. B., & Fretheim, A. (2012). Group based diabetes self-management education compared to routine treatment for people with type 2 diabetes mellitus. A systematic review with meta-analysis. *BMC Health Services Research*, 12, 213. <https://doi.org/10.1186/1472-6963-12-213>
- Yen, P. H., & Leasure, A. R. (2019). Use and effectiveness of the teach-back method in patient education and health outcomes. *Federal Practitioner*, 36(6), 284–289. <https://pubmed.ncbi.nlm.nih.gov/31258322/>