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Applied Research in Diabetes Therapeutic Education

People with diabetes face multiple daily decisions related to their self-management and self-care (1). Diabetes therapeutic education, provided by trained health care professionals, plays a key role in transmitting knowledge and developing skills that enable individuals to make informed decisions, prevent complications, and improve their quality of life (1, 2). Numerous guidelines, protocols, and recommendations emphasize the need to offer therapeutic education and ensure it meets minimum quality standards (1, 3).

Each year, the American Diabetes Association (ADA) publishes the **Standards of Medical Care in Diabetes**, a reference document that establishes guidelines for the comprehensive management of people with diabetes, including education (2). These recommendations are updated annually based on the latest scientific evidence.

The ADA **categorizes the evidence** supporting its recommendations into **levels A, B, C, or E**. Recommendations with level A are supported by rigorous studies such as randomized clinical trials and meta-analyses, giving them high reliability. When there are not enough clinical studies available or there is conflicting evidence, category E is assigned, which is based on **expert opinion** (2).

When we talk about therapeutic education, in general, the levels of evidence supporting several recommendations in the Standards of Medical Care in Diabetes are low. For example, in the section on Facilitating Positive Health Behaviors and Well-being, which addresses diabetes self-management education, **only 2 out of 10 recommendations have an evidence level A**, while 4 are categorized as E (2).

Even more striking is the **Physical Activity section, a fundamental component of diabetes treatment, where none of the 11 recommendations reach an evidence level A**, and five have level C (2), indicating significant limitations in the studies supporting them.

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» There is a general consensus on the importance of therapeutic education to ensure adequate control and follow-up of people with diabetes. However, it is necessary to improve the levels of evidence in this area. This is achieved through **research focused on therapeutic education**.

Although the publication of studies in this field has quintupled since 2005, the quantity of studies does not always translate into quality, and many face significant methodological limitations that can affect the reliability and interpretation of their results.

CHALLENGES IN DIABETES EDUCATION RESEARCH

One of the main challenges is bias in **participant selection**, as studies often include people with certain characteristics, excluding vulnerable groups such as older adults or those with physical or intellectual disabilities (4).

Another challenge is performance bias, because **participants, knowing** they are part of an intervention aimed at improving their self-management, may feel more motivated or pressured, which can generate more positive results than would reflect their usual behavior (5).

Additionally, high **dropout rates** affect the validity of the results, as they only reflect participants with greater commitment or ease in implementing changes, which does not represent the general population (4).

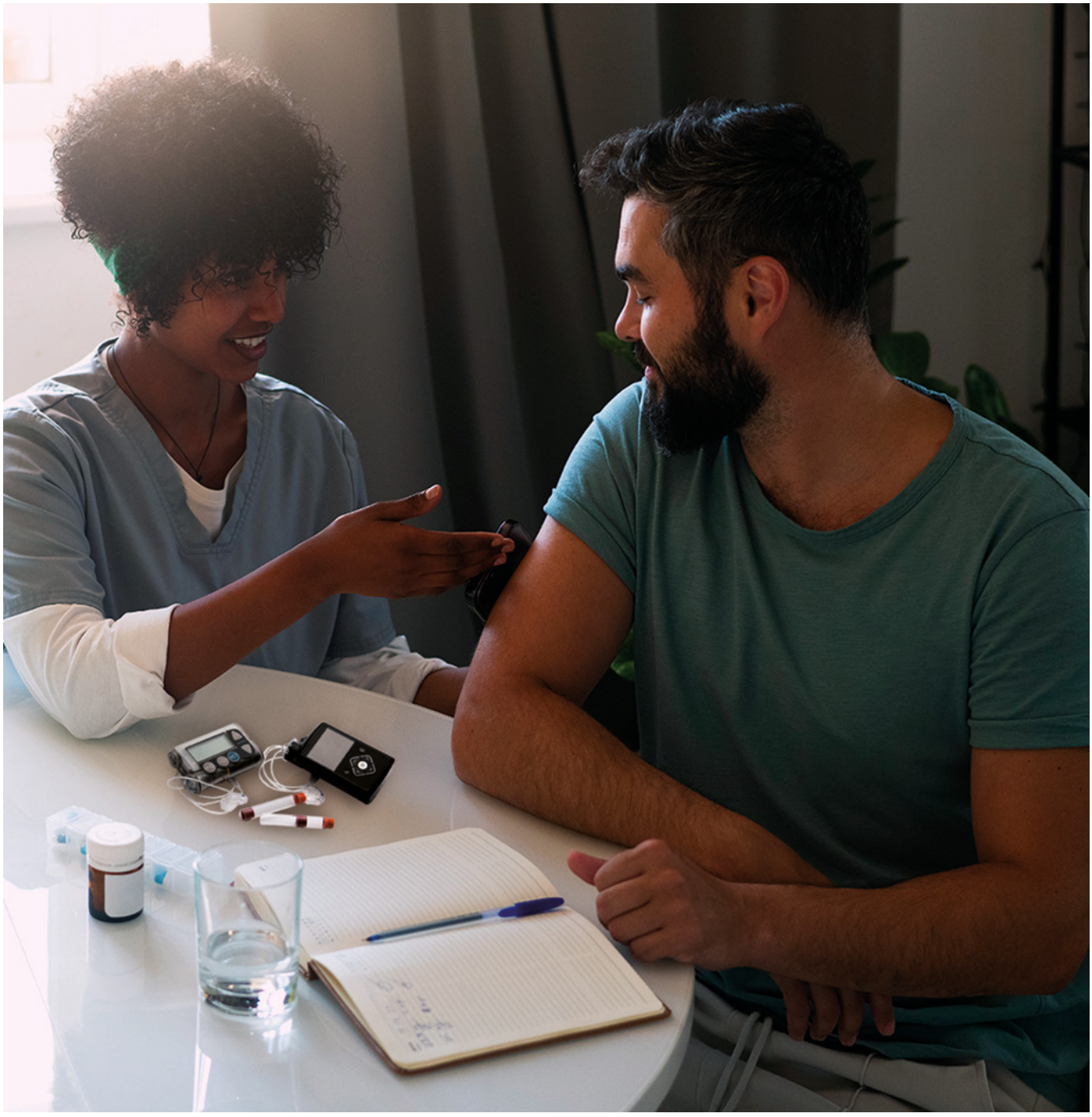
In addition, many studies that include therapeutic education as a study variable do not provide an exhaustive description of the educational program or the characteristics of the participants. This information is key to understanding and replicating the interventions.

To improve the quality and impact of research in this area, it is necessary to standardize how interventions are reported, ensuring that they can be replicated and applied in clinical practice. Some aspects that studies on structured educational interventions in diabetes should include are: (1, 4)

Knowing the **educational level** is also fundamental for adapting and personalizing the intervention. A recent observational »

FEATURE	DESCRIPTION AND EXAMPLE
General Objective	Clearly and broadly express the central purpose. For example: acquire basic and advanced knowledge and skills necessary to initiate insulin pump therapy.
Target Population	Describe the population with inclusion/exclusion criteria. For example: people with type 1 diabetes mellitus who are eligible for initiating insulin pump therapy.
Place and Context	Indicate the environment and conditions in which the educational process will take place. For example: in-person, outpatient clinic at Hospital Clínico Universitario de Santiago de Compostela (A Coruña, Spain)
Modality	Describe the form or manner through which an activity is carried out. For example: individual. In-person combined with tele-assistance.
Individualization	Explain if the process has been adapted to the needs, characteristics, and therapeutic targets of the person. Example: adaptation of vocabulary, techniques, and educational material to teach an adult with low schooling how to count carbohydrate portions.
Methodology and Educational Techniques	Indicate the educational methodologies used. For example: theoretical-practical with simulation exercises.
Curricular Content and Educational Material	Describe the topics/content, objectives, and skills to be achieved. Indicate educational material and tools. For example: catheter insertion, an explanatory leaflet on the technique will be provided.
Duration and No. of Sessions	Explain the duration of the process. For example: 6 sessions of 50 minutes each. Possibility of repeating in case of persistent difficulty.
Assessment of Knowledge Acquisition	Indicate the tools to assess how participants progress in the process.
Participation of Family/Caregivers	Describe the participants in each session.
Profile of Professional(s) in Charge	Indicate the professional responsible for the sessions. For example: nurse specialist in diabetes technologies and nutritionist.
Follow-up and Periodicity	Explain how the process of monitoring, observing, and recording the progress of an activity will be carried out. For example: at 6 and 12 months.
Outcome Evaluation	Indicate the variables to be evaluated (in relation to the patient and in relation to the educational program).

Source: Own elaboration



» study in people who were candidates for continuous subcutaneous insulin infusion therapy showed that people with lower educational levels faced greater difficulty and required more sessions to complete the educational process (6).

Most research on diabetes education is carried out in countries that have defined and protocolized educational programs, such as the United Kingdom and the United States. Therefore, it is important to conduct studies in populations from **other socio-cultural and health care contexts** (7).

In addition to the challenges related to study methodology, one of the most relevant challenges for research in therapeutic education has been the **lack of training or motivation** on »

TRAINING IN RESEARCH METHODOLOGY IS AN OPPORTUNITY FOR PROFESSIONALS TO ACQUIRE TOOLS TO PROMOTE QUALITY RESEARCH IN THERAPEUTIC EDUCATION

the part of the professionals themselves, which has limited the development and application of new approaches. Fortunately, in recent years this has begun to change thanks to a greater offering of specialized training and a growing interest in research in this field, which allows for significant advances in clinical practice.

The Spanish Society of Diabetes (SED) offers continuous training in diabetes, including courses on clinical research methodology, structured therapeutic education programs, diabetes technologies, among others. These initiatives are the first step for more professionals to have the opportunity to acquire tools and empowerment to promote and get involved in quality research from various levels of care.

Despite the multiple challenges, the efforts of various diabetes professionals and educators in Spain in designing and publishing high-level studies must be highlighted.

Future perspectives

- ✓ Integration of new technologies in diabetes.
- ✓ Encourage research from primary care.
- ✓ Promote independent studies, without industry involvement.
- ✓ Non-traditional methods of diabetes education.
- ✓ Expand studies to less represented populations, such as older adults or people with disabilities. D

CONCLUSIONS

Diabetes therapeutic education is a constantly transforming area. Research on this topic has much room to improve its methodological quality and apply quality standards in educational programs. Obtaining higher levels of evidence and taking corrective measures to overcome the limitations that affect its quality could allow for an improvement in health care quality and serve as a reference for future initiatives.

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