

**Aida Carballo Fazanes.**

Faculty of Nursing, Universidad de Santiago de Compostela.
PhD from Universidad de Santiago de Compostela, Clinical
Research in Medicine Doctoral Program. A Coruña, Spain.



Clinical simulation: a practical tool to improve diabetes education

Diabetes mellitus (DM) is a chronic and complex disease with high prevalence that affects individuals of all ages and conditions. The control of DM requires not only multidisciplinary healthcare but also educational support that enables patients to

manage their disease autonomously, prevent acute decompensations (whether hypo- or hyperglycemia), and reduce the risk of chronic complications, thereby improving their quality of life. In the management and treatment of DM, therapeutic education plays a fundamental role (1).

Therapeutic education involves a continuous process of learning and support in which patients, caregivers, and healthcare professionals share an active role. In this context, **clinical simulation** emerges as an innovative tool that allows professionals to acquire technical and communication competencies in safe and realistic environments, with a direct impact on the quality of education provided to people with diabetes. Likewise, it is worth considering whether this type of strategy could also be applied to the training of people with diabetes themselves, enabling them to practice real-life disease management situations in a safe environment.

THERAPEUTIC EDUCATION IN DIABETES

The World Health Organization (WHO) defines therapeutic education as a continuous, patient-centered learning process aimed at helping individuals with chronic diseases acquire the competencies necessary to manage their condition optimally. In practice, this involves understanding diabetes, making treatment decisions, solving potential problems and complications, and adopting healthy lifestyles; in other words, enabling people with diabetes to become active agents in their care (2).

To achieve these learning objectives, therapeutic education in diabetes requires structured, person-centered programs. The process begins with an **initial assessment** of clinical and educational needs, identifying prior knowledge, expectations, and barriers, while establishing trust with the healthcare team. This is followed by the educational intervention phase, where methodology (individual or group sessions, number of visits, **follow-up** time, resources, activities) and content are defined. The third phase is follow-up, adapted to the patient's learning pace and availability. Finally, **evaluation and discharge from the program** take place once the planned objectives are achieved (1).

Therapeutic education is therefore a dynamic and continuous process that evolves throughout the course of the disease and adapts to the needs, knowledge, and context of each individual. In this process, the role of healthcare professionals is essential, as they are responsible for guiding, motivating, and supporting patients. Conse-

quently, professionals must acquire specific competencies in communication, health education, and person-centered care, highlighting the need to incorporate innovative training tools that facilitate the development of these skills.

In this context, clinical simulation can become a key tool to strengthen diabetes education. On the one hand, it allows professionals to develop technical and communication skills in a safe environment; on the other, it contributes to improving the quality of education received by people with diabetes.

WHAT IS CLINICAL SIMULATION?

In recent decades, clinical simulation has become established as an effective and safe educational strategy in healthcare professional training. It is based on recreating realistic scenarios that reproduce essential aspects of clinical practice. Simulation allows the development and practice of skills in a controlled environment without risk to patients, facilitating decision-making, procedural practice, and improvements in clinical communication, teamwork, and stress management. It has also been described as a key tool for improving patient safety, especially in critical or infrequent situations, and it promotes reflective learning through post-experience analysis (known as debriefing) (3).

"Clinical simulation constitutes an educational strategy based on recreating realistic scenarios that allow skill training without risk to patients."

Clinical simulation can take different forms depending on educational objectives and available resources. It may include mannequins or devices that reproduce physiological functions, simulated patients or actors representing real clinical situations, role-playing methodologies among students, professionals, or patients, and structured clinical scenarios that replicate educational consultations or emergency situations.

In diabetes care, clinical simulation allows the recreation of educational consultations, hypoglycemia or hyperglycemia scenarios, and self-care activities such as diet, exercise, glucose monitoring, or insulin administration (4). These scenarios enable professionals and students to practice explaining the »

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» disease, resolving doubts, and supporting decision-making in a safe environment. Simulation also enhances communication and empathy, key aspects for patient engagement and active participation in care (5).

WHY IS CLINICAL SIMULATION USEFUL IN DIABETES?

Clinical simulation offers multiple advantages for diabetes education, both for health-care professionals and for people with diabetes participating in educational programs.

From the perspective of health care professionals, **simulation allows practice without risk to patients**, as errors are part of the learning process and have no real clinical consequences. In a chronic disease such as diabetes, where decisions directly affect safety and quality of life, this feature is particularly relevant.

It also facilitates **training in acute and potentially severe situations** (such as severe hypoglycemia or diabetic ketoacidosis), allowing practice in identification and management. Additionally, it supports the development of technical skills required in these scenarios (4).

A particularly relevant aspect is the **improvement of communication and empathy** with patients and their families, as well as with the care team. Through simulated consultations, professionals can train interviews and educational interventions, recreating complex situations and improving non-technical competencies essential for therapeutic education (5).

Beyond professional training, clinical simulation can directly benefit people with diabetes through participation in simulated scenarios to practice **real-life management situations**. This includes recognizing and treating hypoglycemia, managing exercise, or dietary decisions.

“Participation in simulated scenarios can increase patient confidence in managing their disease”.

This approach allows learning in a safe environment, reinforcing knowledge, increasing self-confidence in self-care, and improving decision-making capacity. Simulation

can therefore be a motivating experience and a valuable complement to therapeutic education.

FROM THEORY TO PRACTICE: EXPERIENCE WITH NURSING STUDENTS

Future nurses, as key professionals in chronic disease management and in the context of increasing diabetes prevalence, must develop competencies to provide comprehensive care. This includes disease management, complication resolution, and continuous patient education (4).

Therefore, it is recommended that training programs in the field of diabetes incorporate innovative approaches that provide students with dynamic experiences closely aligned with real clinical practice. Among these strategies, clinical simulation stands out as one of the essential components (4).

As an example of the application of clinical simulation in the training of Nursing Degree students at Universidad de Santiago de Compostela (A Coruña, Spain), a complex scenario was designed that reproduced an educational consultation with a person with diabetes who was poorly motivated to change habits and who did not follow the recommendations or objectives agreed upon in previous sessions.

This type of scenario allowed students to face a situation frequently encountered in clinical practice, in which, despite having a well-structured educational intervention, each individual presents different characteristics, expectations, and behaviors, making the patient's response, in many cases, unpredictable.

The experience helped students understand that there is a gap between theory and real practice, and that it is necessary to develop skills in adaptation, communication, and empathy to respond to the emerging needs of each person with diabetes. Likewise, simulation encouraged reflection on the importance of flexibility in therapeutic education and a person-centered approach.

In addition to the abovementioned benefits, it was observed that students became actively engaged and showed greater motivation compared to more traditional learning »

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IT IS RECOMMENDED THAT TRAINING PROGRAMS IN THE FIELD OF DIABETES INCORPORATE INNOVATIVE APPROACHES THAT PROVIDE STUDENTS WITH DYNAMIC EXPERIENCES CLOSE TO REAL CLINICAL PRACTICE

» methodologies. These findings are consistent with previous studies showing that simulation applied to diabetes training allows students to increase their competence in therapeutic education and apply what they have learned in real patient care, as well as to act with greater confidence and achieve higher satisfaction with their training (6, 7).

Despite its benefits, clinical simulation presents certain barriers to implementation. These include the material resources and infrastructure required, which may represent a financial limitation; the need for specialized personnel; and the time required to design and develop scenarios (8, 9). Nevertheless, the available evidence suggests that the benefits far outweigh these limitations, particularly in terms of improving competencies, patient safety, and the quality of therapeutic education. Furthermore, as illustrated in the example described, simulation can be adapted to different contexts through low-cost strategies, such as recreating therapeutic education consultations and role-playing activities, in which students themselves assume the roles of professionals or patients, thereby facilitating its implementation even in resource-limited settings. **D**

CONCLUSIONS:

- Clinical simulation can be an effective tool to improve therapeutic education in diabetes.
- It allows health care professionals to train both technical and non-technical skills in a safe environment.
- People with diabetes can benefit from simulation to improve self-care.
- Simulation in nursing students enhances competence, confidence, and empathy in patient care.
- Integrating clinical simulation into educational programs may improve quality of care and health outcomes.

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