

Education of Hospitalized Diabetic Patients: Analysis of Training Needs among Nurses in a Lebanese Hospital – A Secondary Publication

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Abstract: The design of diabetes inpatient educational preparation should be based on the needs of the nurses involved in terms of skills in this area. The objective of this qualitative study is to identify the preparatory needs of nurses working in the medical and surgical units of a Lebanese hospital in terms of Survival Skills Education for Hospitalized Diabetic Patients (SSEHDP). Method: The focus group method is used for data collection using a semi-structured interview guide. The needs expressed by the thirty-two participating nurses were classified into categories of the competency framework for providing self-management education to diabetic patients proposed by the American Diabetes Association. Results: By focusing on the themes of an SSEHDP, a list of preparatory needs was drawn up. The needs identified and analyzed are then translated into general and specific learning objectives for educational preparation. Conclusion: The needs analysis is only the first step in a work that will ideally continue into the implementation and eventual evaluation of an educational program developed to help nurses acquire skills in the education of diabetic patients.

Keywords: Diabetes inpatient education; Nurse training needs; Survival Skills Education for Hospitalized Diabetic Patients (SSEHDP); Qualitative study; Competency framework

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1. Introduction

Nurses have an essential role to play in educating patients about diabetes. Action is needed to facilitate the expansion of nurses' roles to enable them to be an essential force in helping patients self-manage diabetes. For example, the clinical practice guidelines of Diabetes Canada ^[1] demonstrate that diabetes care and education programs should, as much as possible, be provided by a team of professionals consisting of a physician and diabetes educators, including nurses ^[2]. Several pieces of knowledge are provided to healthcare professionals by these guidelines. Furthermore, in the United States, national standards for quality education through diabetes education programs indicate that nurses, along with all team members responsible for this education, should receive ongoing training ^[3]. Similarly, inadequate knowledge among nurses about diabetes and its management ^[4], both in developing countries and in various healthcare contexts, could be addressed by establishing specialized

workplace training programs^[5,6]. Hence the importance of assessing the training and training needs of nurses regarding diabetes.

The role of continuing education is essential to support nurses' knowledge and skills in diabetes^[1,7,8]. Since 1988, the World Health Organization (WHO) has recommended training for healthcare personnel for better patient education. In addition, the American Diabetes Association (ADA) and the Joint Commission on Accreditation of Hospitals consider training healthcare professionals in patient education in hospitals as criteria for good hospital management to ensure a safe transition from hospital to home^[5]. Moreover, all healthcare professionals caring for diabetic patients should receive continuous updates on diabetes management through educational activities^[10]. Many member organizations of the International Diabetes Federation (IDF) mention that the most critical issue hindering diabetes education and care is the lack of qualified healthcare professionals and training programs^[7,10]. Thus, international standards for diabetes education have been developed by the IDF. They provide guidance on essential information that healthcare professionals should know about diabetes and its management. Several researchers strongly support the importance of continuous education for nurses to capitalize on their knowledge and improve their skills to ensure quality diabetes care^[6,11-16]. However, the needs analysis process is essential to maximize the achievement of different types of training activities' objectives.

Internationally, several obstacles have been reported as contributing to nurses' inability to acquire or maintain adequate knowledge about diabetes. These include inadequate training, lack of access to relevant resources, limited experience in caring for diabetic patients, and low participation in continuing education on diabetes^[4]. High workloads and low morale among nurses have also been identified as obstacles to improving their knowledge of diabetes and its management^[6]. Hospitals need to focus on these obstacles because ensuring professional competence is an important strategy for improving diabetes care and education in acute care facilities^[17,18]. Several strategies can be implemented to improve nurses' skills in diabetes care and management. Continuing education is an integral part of helping nurses update their knowledge of diabetic patient management^[19] and maintaining their skills^[17]. According to Nassar *et al.*^[20], training bedside nurses to educate hospitalized patients about managing their diabetes is one of the avenues explored to help increase the capacity to reach a higher proportion of patients than can be reached by a diabetes specialist. In Lebanon, Lebanese managers consider adequate initial training and continuing education as important factors contributing to the development of nursing competence^[21]. Moreover, maintaining and improving nurses' skills through continuous training is one of the important accreditation standards for hospitals in Lebanon^[22].

For a long time, it has been known that hospitalization provides an opportunity to meet urgent patient learning needs, especially because it guarantees access to the patient^[23,24]. It can also be the only opportunity to educate a patient^[24], especially in countries where primary healthcare is not yet developed. People with diabetes are more likely to be admitted to the hospital and have an increased risk of complications, longer stays, and a greater likelihood of readmission within the same month^[25-27]. So far, no study has estimated the hospitalization rate of diabetic people in Lebanon. In 2012, in the United States, over 25% of all hospitalization days were generated by diabetics^[28]. Adults diagnosed with diabetes have a 3.5 times higher risk of hospitalization than those without a history of diabetes, while those with prediabetes are 1.3 times more likely to be hospitalized^[29]. Rubin^[30] and Dungan^[31] have shown that the risk of readmission^[3] for diabetic patients, regardless of the main reason for hospitalization, is increased compared to those without diabetes. Moreover, national data in the UK confirm that, on average, a diabetic patient spends more time in the hospital than a non-diabetic patient, despite being admitted for the same procedure or condition other than diabetes^[32]. Medical costs are directly associated with diabetes and include expenses for diabetes prevention and treatment and its complications, covering outpatient and emergency care, inpatient hospital care, and long-term care. The main cost factors of diabetes are

hospital and outpatient care^[33]. Several factors can make care transitions difficult and hospital discharge unsafe, including poor patient education^[34]. According to the American Diabetes Association^[7], high-quality hospital care for diabetes requires delivery standards. Protocols, examinations, and guidelines are available, such as those for blood glucose control in hospitalized patients^[27] and education on essential survival skills before hospital discharge^[28].

Ideally, according to the ADA^[7], teaching individuals with diabetes should occur at an appropriate time and in a conducive learning environment, as an outpatient in a recognized diabetes education program. Therefore, educational intervention, which is a continuous process, primarily takes place in primary care. However, one of the four critical periods identified to assess, provide, and adjust education is when care transitions occur, such as those related to hospital discharge^[9]. In summary, on the one hand, hospitalization seems to be a more suitable period for conducting educational interventions, and on the other hand, these educational activities must be structured, and linked to patients' needs, priorities, and beliefs. Moreover, the ADA^[28] suggests that "survival skills" for diabetes are a reasonable approach to providing sufficient education to enable a safe transition from hospitalized to home-based patients. Thus, education for hospitalized diabetic patients should include medication, blood glucose monitoring, recognition of hypoglycemia and hyperglycemia, and basic meal planning^[13,28,35]. Several studies have shown the benefits of educating diabetic patients in the hospital, such as a lower frequency of hospital readmissions^[35], improved medication adherence after patient discharge from the hospital^[36], and better glycemic control at home^[37].

In Lebanon, many Lebanese patients with diabetes do not comply with recommendations for a healthy lifestyle or treatments as prescribed by their physician, nor do they receive appropriate education to help them control their disease^[38]. For the majority, the rate of adherence to therapeutic recommendations regarding diabetes does not exceed 29.6%^[38]. This problem stems from the lack, apart from a few sporadic and ephemeral trials, of diabetes patient management centers. Furthermore, hospitalization may be the only opportunity for the patient to receive educational intervention, especially with primary healthcare services being organized and the scarcity of educational programs for diabetic patients. Hence the importance of educating these patients in the hospital setting. Moreover, it is in this environment that nurses have the most contact with diabetics. In this regard, these nurses must master methods and strategies to acquire and apply up-to-date knowledge about diabetes to educate patients on blood glucose management, nutrition, and medication to minimize the development and progression of acute and chronic complications associated with poorly managed diabetes.

The Lebanese Bachelor of Nursing program provides a broad base of knowledge and skills to prepare the graduate nurse to develop and implement the care plan and to be the link between the patient and the healthcare system. A key element defining nursing practice is the emphasis on health promotion and risk reduction. The nurse's educational role is defined through their professional role. A general health education course is given to nurses during their university curriculum according to the different programs present. A registered nurse must develop, at a high level, communication and assessment skills, critical reasoning, and clinical judgment to care for patients. In practice, hospital nurses convey information or distribute brochures to patients before their discharge. Moreover, commitment to lifelong learning is an essential element of the nursing profession in Lebanon. According to El-Khoury^[39], knowledge development and increased knowledge are goals for Lebanese nurses to pursue throughout their professional lives. On the one hand, according to university programs, they attend a general course on therapeutic patient education approaches. Moreover, it is in an endocrinology course that they learn essential information to convey to a diabetic patient for better self-management. Of course, the content taught in such a course is not related to therapeutic patient education, which is a process that cannot be summarized by the delivery of information alone. The latter alone would not be sufficient to help patients

manage their disease on a daily basis. It is especially during a professional master's program that they will have an opportunity to further deepen the concept of therapeutic patient education and its practice. Thus, it is nurses who have initiated a second-cycle study program who have the most knowledge in this area. For all Lebanese nurses, continuing education will enable them to acquire or update knowledge to provide care and education corresponding to the best practice standards for people with diabetes.

In conclusion, the Lebanese hospital nurse seems to be the most suitable person among healthcare professionals to promote education for diabetic patients. The role of continuing education is essential to support nurses' knowledge and skills in diabetes and education of essential skills for hospitalized diabetic patients (Survival Skills Education for Hospitalized Diabetic Patients [SSEHDP])^[1,7,8]. Identifying nurses' training needs appears as the first essential step and one of the best means to implement a training program that could support nursing practice. It is in this context that the authors' reflections emerged. Thus, the purpose of this study is to analyze the training needs of nurses working in medical and surgical units in a Lebanese hospital regarding SSEHDP.

2. Reference framework: Malcolm Knowles' andragogical approach

In the scientific field, any research concerning new training must be based on a theoretical learning framework. The learning paradigm, to which teaching refers by engaging in the implementation of training devices, must be clear. The theories of adult learning play an essential role in the design and implementation of training programs, including those for healthcare professionals. The potential application of these theories in nursing education underscores the importance of linking educational practices to learning theories. The philosophy of education and learning theory underpins all educational practices, as they provide conceptual frameworks describing the acquisition of knowledge, skills, and attitudes by an individual, enabling the modification of their behavior, performance, or potential^[40]. In a humanistic approach to education, several learning theories are put forth, including Malcolm Knowles' theory of adult learning based on andragogy, which forms the basis of this study.

According to educational science, adult education is designed around the needs and interests of learners^[41]. Knowles did not present how to achieve this crucial step of identifying needs and interests, but he considers that a model of behavior, performance, or desired skills is an effective means of determining learning needs^[42]. When the learner understands how acquiring certain knowledge or developing skills will enable them to perform better in life, they engage in teaching situations, even didactic ones, with a clearer goal and consider what they learn as more personal. Referring to Knowles' definition, the educational need in this study is considered a necessity that a nurse must learn for their own benefit in their educational role, for the benefit of the hospital, and for the benefit of hospitalized diabetic patients. Indeed, identifying needs will enable the development of a training or educational intervention plan^[42-44]. Needs assessment data will determine learning objectives and contribute to the resulting pedagogical design^[41,45-47]. Moreover, it will establish an environment conducive to learning and continuous improvement. Training needs analysis is fundamental in different organizational contexts, including hospitals^[47]. Furthermore, according to Bloom^[48], well-defined training objectives help to have a clear statement of what educational action should bring about change for learners.

In fact, a recourse to andragogy, defined as the art and science of adult learning and focusing on the specificities to be taken into account in their training, has been selected^[49]. The scientific nature of andragogy lies in the fact that it proceeds scientifically in the planning, application, and evaluation of educational interventions. Its art lies in the relational climate that must exist between the learner and the trainer. Moreover, training actors use the andragogical approach to implement pedagogical devices for adults. The reality in which

adults operate and their needs are quite different from those of children and young adults. Andragogy focuses on the specifics of adult development that need to be considered in adult education. According to Knowles^[49], adults perceive themselves as beings capable of making their own decisions, assuming the consequences, and managing their own lives. This author considers assisting learners in achieving maturity by developing all their potentialities as a mission of andragogy^[41]. This stems from the effort of a trainer to define what is specific to adult continuing education. In the framework of andragogy, there are four assumptions related to adult learners: (1) adults are self-directed rather than dependent on others, (2) life experiences provide adults with a learning resource as the individual matures, (3) adults fulfill societal roles by seeking learning experiences to meet recognized needs, and (4) adult learners seek answers to immediate problems^[41,50,51].

Finally, according to Knowles^[50], “continuing education is based on the notion that in a world where changes are accelerating, learning must be a continuous process from birth to death.” Continuing education is essential for nurses to have the knowledge and skills necessary for the education of diabetic patients. As Knowles^[49] recommended, the learner works with a skills model to design a learning model. Thus, nurse training through a competency-based approach, referring to a competency framework for the education of diabetic patients, will be useful. No one can oppose the idea of building professional nursing education from a realistic analysis of practice. The theory of adult learning is an appropriate framework that nurse educators can use to determine the levels of knowledge and skills of hospital nurses in diabetes management and education of hospitalized diabetic patients, as well as their need for diabetes training.

3. Methodology

3.1. Design

A descriptive qualitative interpretative design that emphasizes discovery, exploration, and the quest for meaning of phenomena and relationships between components, from the perspective of participants, was utilized^[52]. In this study, the aim is to establish links between the practice of SSEHDP by nurses and the associated competencies to better understand the training needs of these nurses. The needs analysis process was carried out by addressing the following main components: (1) sources and strategies underlying the assessment of needs; (2) data collection method and the tool to be used; (3) description of the population or samples from whom data will be collected; and (4) data analysis method and prioritization of needs^[43,45,46].

3.2. Sources and strategies underlying the needs assessment

The data for needs assessment can come from three sources: providers of continuing education in an institution, literature, or the target population. In our study, based on the literature, a competency framework for healthcare professionals and diabetes educators focusing on diabetes self-management education was used as a source. Additionally, the IDF^[10] document on international standards for diabetes education for healthcare professionals, which also addresses the needs assessment process as a preliminary step to diabetes education development and implementation, was chosen. This aligns with the needs assessment process by the competency model described by Knowles^[41], which is a method through which participants in continuing education compare their current level of practice performance to a standard.

3.3. Data collection method and tool

The focus group method was used for data collection to identify the training needs of nurses regarding the practice of SSEHDP. Most methodological works on focus groups consider this method from the qualitative research field ideal for conducting needs analysis^[53-55]. This method also allows planning elements for the

development of training and evaluating its impact on participants ^[43,53,54]. Data collection relied on a semi-structured interview guide developed by the first author, which proposed an order of questions to guide the conversation without imposing it. This guide helps structure discussions around central themes and sub-themes related to nurse competencies in SSEHDP.

The questions in the developed interview guide were designed according to the recommendations by Morgan and Krueger ^[55]. This guide helps structure discussions around central themes and sub-themes related to nurse competencies in SSEHDP. Thus, a question formulation was made for themes from the competency framework and the document on international diabetes education standards for healthcare professionals, both of which were already chosen as a theoretical structure or source for training needs analysis. The first author used a deductive process based on source documents to develop the interview guide that would enable training needs analysis. More concretely, she began by considering what would be important to ask to understand training needs on SSEHDP, then created interview questions based on this understanding. Her review of the literature directed her toward (1) the importance of competency frameworks for training needs analysis and development of training for professionals, and (2) the relevance of international education standards and diabetes education modules for healthcare professionals from IDF, which provides guidance on essential information that healthcare professionals need to know about diabetes and its management. The interviews were recorded to allow for in-depth analysis of all that is produced in the discussions. Additionally, the first author took notes as a memory aid to frame the facilitation and reveal the attitudes of participants.

3.4. Population and sampling

Recruiting participating nurses for discussion groups was an important step. Inclusion criteria include nurses in medical and surgical services of a Lebanese hospital who agreed to participate in the study. Nurse managers and those with specific training in therapeutic education of diabetic patients were excluded from the discussion groups. In fact, participating nurses could better express their needs in the absence of their manager. Specialized nurses were excluded because they would not have the same needs as the majority of nurses working in these services. Finally, convenience sampling was used to select available, easily accessible nurses who meet the specified inclusion criteria. The purpose of this is to facilitate data collection and minimize the risk of confrontation between participants. In this study, four groups (8 participants per group) were required based on the data collected to achieve content saturation (when there is nothing more to learn from one group to another). The duration of the meetings was one to one and a half hours. The number of necessary groups is certainly linked to a deep understanding of nurse training needs rather than statistical representativeness ^[55]. The assistance of managers from the medical and surgical units, the director of nursing, and nurses from the hospital's continuing education unit was necessary for the planning of these discussion groups. Data were collected by the first author responsible for the study in January 2019 in the meeting room of the Lebanese hospital. The study was approved by the Research Ethics Committee of the first author's university. Participation was voluntary, and a consent form was completed.

3.5. Data analysis method

The qualitative data analysis began at the end of data collection. First, a floating reading of the corpus was performed, followed by data condensation, coding, and thematic and categorical identification (reading and rereading of the data transcript to develop an overall view from the participants' perspective, progressive construction of a thematic tree). Repeated reading of verbatim and notes taken during and after the interview was done for data appropriation. In this study, the analysis grid was pre-constructed based on the research objectives and comprised predetermined categories derived from source documents and literature review. A deductive approach is justified as a predetermination of SSEHDP competencies that will form the basis of

interview analysis preceded by the reading of reality. Thus, the categories concerned the priority training needs of nurses in terms of general knowledge and skills to deliver SSEHDP, as well as preferred learning modalities.

4. Results

Thirty-two nurses participated in this study. **Table 1** presents the demographic and descriptive data on these nurses. The results are presented according to the open-ended questions asked, which pertained to their perception of their educational role with diabetic patients, SSEHDP, associated competencies, main training needs, and the type of training enabling them to integrate the necessary competencies for SSEHDP.

Table 1. Sociodemographic characteristics of nurses participating in the study

Sociodemographic characteristics <i>n</i> (%)		Total sample (<i>n</i> = 32)
Gender	Female	23 (71.88%)
	Male	9 (28.13%)
Educational level	Bachelor's degree	25 (78.12%)
	Master's degree	4 (12.50%)
	Advanced diploma	3 (9.38%)
Years of experience	1 to 2 years	1 (3.12%)
	2 to 5 years	22 (68.75%)
	6 to 10 years	4 (12.50%)
	> 10 years	5 (15.63%)
Unit	Medicine	18 (56.25%)
	Surgery	14 (43.75%)
	0	0 (0.00%)
Number of diabetic patients per nurse per week	1 to 2	1 (3.13%)
	2 to 5	22 (68.75%)
	6 to 10	4 (12.50%)
	> 10	5 (15.63%)
	None	10 (31.25%)
Participation in on-the-job training or continuous education sessions focused on diabetes	6 months	5 (15.63%)
	6 – 12 months	6 (18.75%)
	12 – 24 months	4 (12.50%)
	> 24 months	7 (21.88%)
Barriers to glycaemic management in the hospital	Lack of knowledge	26 (81.25%)
	Uncertain glycaemic target	6 (18.75%)
	Ineffective insulin regimen	31 (96.87%)
	Communication during handover	2 (6.25%)
	Unfamiliarity with hospital policies	2 (6.25%)
	Lack of coordination between blood sugar measurement, insulin administration, and meals	30 (93.75%)

4.1. Nurses' perception of their educational role

All participating nurses considered their role in educating diabetic patients to be essential. However, personal and organizational obstacles were identified. Thus, lack of time, knowledge, as well as lack of support from managers was implicated in the ineffective practice of SSEHDP. Examples of verbatim are presented in **Table 2**.

Table 2. Verbatim concerning nurses' perception of their educational role

	Verbatim
Perception of the educational role of diabetic patients	“Due to lack of time, I only provided information to diabetic patients before their discharge, even though I know the importance of thorough therapeutic education provided by the nurse to empower the patient” (NURSE 13).
	“Even if I find time to inform my patient about their diabetes, I know it's my role, but I lack a lot of pharmacology knowledge. If a patient asks me questions about their medication or blood glucose values, I always struggle to answer. Each endocrinologist specifies slightly different values, which can confuse the patient and the nurse” (NURSE 5).
	“The nurse plays a primordial and essential role in equipping the patient to face the reality of diabetes and to achieve optimal management of their disease. But how can you educate a patient if the manager doesn't understand that fewer patients should be taken care of to have more time to attend to patients with chronic diseases?” (NURSE 1).
	“The nurse must know everything related to diabetes to encourage the patient to self-manage” (NURSE 5).
	“We need to know the new guidelines regarding education for hospitalized diabetic patients, and also, we must not forget that the endocrinologist has no time to educate them, and there is no place where the patient can go for therapeutic education” (NURSE 23).

4.2. SSEHDP, skills, and training needs

A list of important themes to consider in the analysis was established before beginning the processing of the collected material. Thus, the responses were analyzed according to categories or groupings of predetermined themes related to SSEHDP. These themes include essential skills for educating hospitalized diabetic patients: medication, blood glucose monitoring, recognition of hypoglycemia and hyperglycemia, and basic meal planning. Additionally, the addition of two categories, diabetes pathophysiology, and teaching and learning skills, seemed necessary to address the purpose of this needs analysis based on resource documents (competency frameworks for diabetes educators and international standards for diabetes education for healthcare professionals). Two thematic axes grouped within the categories were necessary to identify the significance and training needs for each of these skills. Content analysis of interviews provided a clearer picture of the expressions used by participating nurses to enrich or nuance the results of the SSEHDP training needs analysis. The results are structured in tree form in **Figure 1**. **Table 3** presents examples of verbatim corresponding to SSEHDP in general and not specific to the themes chosen in the analysis guide. **Table 4** presents examples of some verbatim related to the themes they represent. The data align well with these themes, which are closer to a “practical theme” related to SSEHDP. Based on the tree structure in Figure 1, a list of training needs for nurses can be derived, which should form the basis for developing specific objectives for training modules. Codes (Need I, II, III, IV, V, and VI) related to these needs are identified to ensure that the training to be developed addresses these needs.

Table 3. Examples of verbatim corresponding to education on essential skills for hospitalized diabetic patients in general

	Verbatim
Education on essential skills for hospitalized diabetic patients	“It’s about informing the patient about the importance of being able to control and understand what diabetes is” (NURSE 1).
	“It’s about providing correct and accessible guidelines for self-care” (NURSE 6)
	“It’s raising awareness in the patient about the disease, prevention methods, and self-control, thus avoiding possible complications” (NURSE 28)
	“It means informing the patient about the pathology and its complications (...) which is fundamental for the quality of life of the person affected, minimizing complications” (NURSE 10)
	“Nurses in basic training have very little knowledge about SSEHDP (...), we often have to resort to other training and information to feel confident working with diabetic patients” (NURSE 16)
	“We always need training, to update ourselves, to know the latest in diabetes and the new guidelines regarding the education of diabetic patients in the hospital (...)” (NURSE 11)

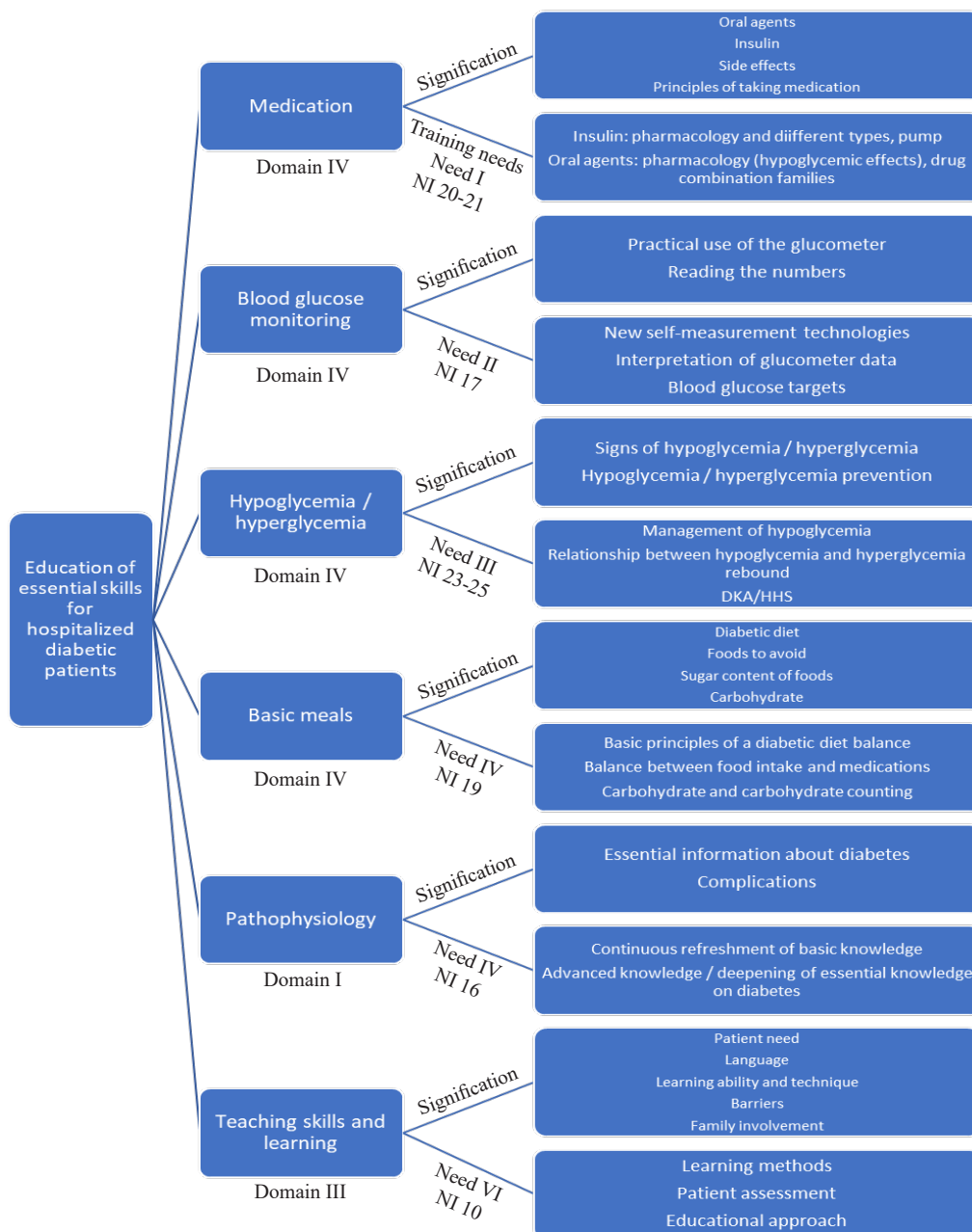


Figure 1. The tree structure of the training needs analysis

Table 4. Examples of verbatim related to the themes of the analysis

Themes	Verbatim
Medication	<p>“We have trouble understanding why the medical prescription includes several antidiabetic agents” (NURSE 14).</p> <p>“(…) which oral medications can cause hypoglycemia” (NURSE 18).</p> <p>“(…) difficulty related to administering medications on time according to prescription, especially in the surgery department with patients left NPO, we always wonder whether to give the patient medication on the day of their operation or not” (NURSE 4).</p> <p>“Use of insulin bottles specific to patients and whose generic name is different from what we have in our hospital fridges” (NURSE 22).</p> <p>“There are various pumps and pens for insulin injection, and the principles of glucose management with these two types of devices are sometimes unknown” (NURSE 2).</p> <p>“(…) and the pharmacodynamics of insulin to make decisions in case of hypo/hyperglycemia” (NURSE 10).</p>
Blood sugar monitoring	<p>“The patient can do his own blood glucose test, but he asks you to analyze the number” (NURSE 16).</p> <p>“(…) and blood glucose values in case of acute illness or surgery” (NURSE 25).</p>
Hypoglycemia / Hyperglycemia	<p>“You have to inform him how to prevent and treat hypoglycemia” (NURSE 9).</p> <p>“And patients transferred from the emergency room for diabetic ketoacidosis and treatment with electrodes and we don’t understand how to monitor them” (NURSE 14).</p>
Basic meals	<p>“We lack a lot of knowledge about the carbohydrate and sugar content of foods” (NURSE 7).</p> <p>“(…) and healthy eating habits” (NURSE 29).</p> <p>“We never learned about carbohydrate counting principles and portion control (…) sometimes we call the dietitian to answer a question posed by the family about the diet” (NURSE 5).</p>
Pathophysiology	<p>“(…) Interest in knowing the complications of diabetes” (NURSE 3).</p> <p>“What is the disease to know how to educate on living with it” (NURSE 28).</p> <p>“I support that we lack knowledge on everything new about diabetes” (NURSE 13).</p> <p>“All the knowledge we have had needs to be updated, when you see the literature, everything has changed” (NURSE 19).</p>
Teaching and learning skills	<p>“Do not use technical words not understood by the patient” (NURSE 24).</p> <p>“Make them see (…) there are people who are interested in seeing in practice what we are learning (…)” (NURSE 1).</p> <p>“This education must be planned from the patient’s admission and according to their needs (…) a need assessment must be done” (NURSE 21).</p> <p>“Do not forget to involve the family” (NURSE 17).</p> <p>“We must consider how he learns better, is it by using videos, is it by manual application” (NURSE 9).</p> <p>“Nurses are responsible for assessing the learning needs of patients and their families to help patients leave the hospital safely” (NURSE 15).</p> <p>“It’s the interview that allows us to see what to educate the patient about” (NURSE 8).</p>

4.3. Type of training

Regarding the type of training, it emerged that the participants value participating in interactive training. They expressed a desire for varied educational strategies such as interactive lectures, clinical case studies, and exercises, mentioning that they are interested not only in knowledge related to SSEHDP but also in the practice of this education. **Table 5** provides examples of some verbatim related to the desired type of training.

General and specific learning objectives were drafted directly in line with the needs assessment that was conducted. They are presented starting from objectives related to simpler cognitive skills (knowledge and comprehension) to more complex cognitive skills and competencies (synthesis and evaluation). In this article,

only the general training objectives are presented in **Table 6**. The specific objectives will be presented later in an article dedicated to the design of the training.

Table 5. Examples of verbatim related to the type of training

	Verbatim
Type of training	“We are interested in more interactive training, which in my opinion is more effective than lectures and PowerPoint presentations” (NURSE 30).
	“For the development of our clinical skills in SSEHDP, why not practice with real patients in your presence or with an expert” (NURSE 7).
	“Acquisition of clinical knowledge from situations representative of our clinical reality and exercises” (NURSE 26).
	“... why not structured educational videos to watch from home” (NURSE 19).
	“A short training focused on developing skills will be much appreciated” (NURSE 22).
	“We just need to validate our knowledge of diabetes because we all come from the academic environment and we’re not interested in taking a diabetes course during training (...) and using team challenges, games, or anything that motivates us to learn about SSEHDP” (NURSE 28).

Table 6. General objectives of the training according to Bloom’s taxonomy

Bloom’s taxonomy	General objectives of the training
Knowledge	At the end of the training, learner nurses will be able to recognize general knowledge about diabetes and its management.
	At the end of the training, learner nurses will be able to understand the essential skills to educate hospitalized diabetic patients before discharge.
Understanding	At the end of the training, learner nurses will be able to understand the basic principles for educating essential skills in hospitalized diabetic patients.
Application	At the end of the training, learner nurses will be able to practice SSEHDP.
Analysis	At the end of the training, learner nurses will be able to model SSEHDP.
Synthesis	At the end of the training, learner nurses will be able to synthesize everything related to SSEHDP.
Evaluation	At the end of the training, learner nurses will be able to evaluate SSEHDP.

5. Discussion

According to the literature, continuous training on diabetes for all healthcare professionals, including hospital nurses, is important. Training needs analysis is an integral part of the various phases of developing a training plan. Moreover, it is an important element for continuous professional development, which is essential in modern nursing care. The National Institute of Public Health of Quebec considers that training needs analyses ensure the relevance of training activities for professionals, concerned with the need to increase the quality and efficiency of work ^[56]. According to Knowles ^[41], needs analysis constitutes the foundation upon which any training program or activity will be developed.

The training needs analysis on SSEHDP of nurses in medical and surgical units identified specific needs related to SSEHDP. Indeed, several studies have shown nurses’ lack of knowledge about diabetes; they concluded their training needs and recommended the development of training to address these needs ^[4,11,12,14,15]. The needs expressed by the participants in our study align with those of a study that identified the needs of nurses for postgraduate education to develop a basic education program on caring for diabetic patients in a university hospital

in Turkey ^[6]. Nurses considered that the most common problems encountered in diabetes management are in the areas of medication and management of diabetic emergencies. Specifically, the need for effective education in self-management for patients with diabetes has been mentioned by various authors ^[57-59]. Additionally, global organizations and various national diabetes associations have issued recommendations regarding the need for training needs analysis on diabetes for nurses working in different healthcare settings ^[1,7,9,10,60,61].

Furthermore, according to this training needs analysis study, participating nurses considered their role in educating diabetic patients to be extremely essential. However, they mentioned the need for special training in diabetes management and education as a starting point for applying for this role. This aligns with the results of several studies focusing on the nurse's role in diabetes management ^[62,63]. Indeed, during their initial training, Lebanese nurses do not receive sufficient knowledge or develop the required skills regarding education for people with chronic diseases such as diabetes. Moreover, the lack of diabetes-specialized nurses in the Lebanese context and the necessity for non-specialized nurses to acquire the necessary knowledge and skills to properly care for diabetic patients should be considered. Indeed, the lack of knowledge and skills on diabetes among nurses is considered a personal barrier to effectively managing this chronic disease ^[64-66]. Additionally, nurses in our study stated that heavy workloads, inadequate time, lack of support from managers, and lack of educational resources were the main obstacles to patient education. This aligns perfectly with the results of other studies focusing on barriers or organizational factors influencing patient education practice, including the lack of continuous training on diabetes, which was perceived by nurses ^[6,58,67].

6. Strengths, limitations, and implications

This study has several strengths, particularly the consideration of training needs in SSEHDP and the preferences of nurses that influence participation in training, as well as the use of source documents for training development. Identifying the training needs of participating nurses allowed the design of a learning activity based on their needs, as well as normative needs in the field of diabetes. The source documents at the basis of all training development stages are considered a strong point. On one hand, the use of the ADA's ^[28] nursing competencies framework in diabetes self-management education provided precision on the skills to develop and the attainment levels. The framework was also used as an analysis framework for training needs; it was reviewed and the chosen skills were more specifically related to SSEHDP. On the other hand, the IDF's standards for healthcare professionals' education on diabetes provided guidance on the essential information these professionals need to know about diabetes and its management. Content standards related to patient diabetes self-management education were reviewed to select those applicable to SSEHDP training.

Some limitations of this pilot study remain. Firstly, the single-source origin of the sample from a single Lebanese hospital does not allow for the representativeness of all Lebanese nurses. Additionally, the sample size was small but adequate in the context of this study as it did not aim to obtain sufficient statistical power.

- (1) Practice: Essential skills for diabetic patients in self-management are an integral part of diabetes care, and with nursing education and support, the disease can be managed, and complications can be prevented ^[7]. Hospital nurses, in their daily work, have the responsibility for the overall care of a diabetic patient. Given the current Lebanese context in which hospital nurses are more confronted with playing their educational role, this training can represent a potentially effective intervention to improve nurses' knowledge and skills in SSEHDP. It provides resources to nurses to increase and standardize the provision of EHPDH in this hospital setting.
- (2) Training: Based on the results of this study, it is wise to recognize the importance of an educational

intervention for hospital nurses caring for diabetic patients to improve their practice of SSEHDP. This finding leads the authors to propose future directions that could enhance nursing practice in patient education on diabetes and its management. It would also be appropriate to include in the initial and continuing education curriculum of nurses content related to educating essential skills for hospitalized diabetic patients. The next challenge is to individualize learning by offering personalized pathways based on the knowledge, skills, experiences, and interests of each nurse.

- (3) Research: Furthermore, it would be appropriate to translate the concept of nurses' training needs into indicators allowing the measurement and evaluation of SSEHDP. Learning needs will be identified based on the gap between the desired situation, which corresponds to the ideal skills necessary for nurses' SSEHDP practice, and the current situation, which corresponds to the actual skills of nurses. To achieve this, developing a questionnaire for prioritizing needs extracted from a bank of competencies in SSEHDP would be appropriate.

7. Conclusion

Conducted through a qualitative design with nurses working in a hospital setting, this research is one of the few studies analyzing the training needs of nurses in SSEHDP. Focusing on skills in diabetes self-management education, this study offers, despite the identified needs, a precision of the objectives of training. Nurses thus choose aspects of training that improve their practice according to their needs. Finally, it seems important to specify that the results of this present study will be used wisely, as we are committed to continuing the reflection and promoting the development and testing of ongoing training in SSEHDP within a Lebanese hospital. This training would initially target nurses from this hospital but could later be generalized to all hospital nurses caring for diabetic patients.

Disclosure statement

The authors declare no conflict of interest.

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