

## SPECIAL REPORT

# Case study: School-based care for a girl and her primary caregiver experiencing difficulties in managing diabetes treatment

Ana Nombela-Franco RN, MD<sup>1</sup> | Cristina Oter-Quintana RN, MD<sup>2,3,4</sup>  | Juana Robledo-Martín RN, PhD<sup>2,5</sup> 

<sup>1</sup>Doctorate in Medicine and Surgery, Autonomous University of Madrid, Madrid, Spain

<sup>2</sup>Nursing Department, Autonomous University of Madrid, Madrid, Spain

<sup>3</sup>Nursing and Health Care Research Group, Puerta de Hierro-Segovia de Arana Health Research Institute (IDIPHISA), Majadahonda, Spain

<sup>4</sup>Doctorate in Health Sciences, Rey Juan Carlos University, Alcorcón, Spain

<sup>5</sup>Gregorio Marañón Health Research Institute (IISGM), Madrid, Spain

## Correspondence

Cristina Oter-Quintana, Nursing Department, Autonomous University of Madrid, Madrid, Spain; Nursing and Health Care Research Group, Puerta de Hierro-Segovia de Arana Health Research Institute (IDIPHISA), Majadahonda, Spain; Doctorate in Health Sciences, Rey Juan Carlos University, Alcorcón, Spain.  
Email: [cristina.oter@uam.es](mailto:cristina.oter@uam.es)

## Funding information

This study received no financial support from external sources.

## Abstract

**Purpose:** To describe the use of the nursing process and standardized nursing language by the school nurse to facilitate the monitoring of the therapeutic regimen of a girl with type 1 diabetes mellitus and her caregiver.

**Methods:** Data were collected through clinical reports, observation, and physical examination of the girl and through interviews with her and her caregiver in accordance with Virginia Henderson's conceptual model.

**Findings:** Clinical reasoning informed the selection of NANDA-I nursing diagnoses. NIC nursing interventions were selected taking into consideration the available scientific evidence related to the care of children with type 1 diabetes mellitus.

**Conclusions:** The school nurse is a key figure in improving and supporting the monitoring of the prescribed therapeutic regimen for children with chronic disease.

**Implications for nursing practice:** This case demonstrates the importance of adopting a conceptual model to guide the nursing process, as well as showing that standardized nursing languages are suitable for school nursing practice.

## KEYWORDS

diabetes mellitus Type 1, health education, nursing diagnosis, school nursing, standardized nursing terminology

## INTRODUCTION

Type 1 diabetes mellitus is the most common chronic disease in children, typically appearing at the age of 4–6 or in puberty (10–14 years) (Dai et al., 2022). It requires the child and their family to make significant lifestyle changes. Ongoing education and support for self-management of the disease is essential to facilitate the behavioural changes needed for effective disease monitoring (Neu et al., 2019; Siminerio, 2015).

School nurses play a key role in health promotion and care for children with chronic health conditions. Their healthcare activities revolve around health education for the child, family, school staff, and classmates to help them cope with the illness and improve support at school (López Langa et al., 2015; Martinez et al., 2018; Wang et al., 2013).

The theory proposed by Virginia Henderson can be used to guide school nursing practice. Children become more autonomous when they attend school (between the ages of 6 and 12). In schoolchildren with chronic health conditions, knowledge of their stage of development

This is an open access article under the terms of the [Creative Commons Attribution-NonCommercial](https://creativecommons.org/licenses/by-nc/4.0/) License, which permits use, distribution and reproduction in any medium, provided the original work is properly cited and is not used for commercial purposes.

© 2022 The Authors. *International Journal of Nursing Knowledge* published by Wiley Periodicals LLC on behalf of NANDA International.

enables school nurses to promote self-management of the disease, although they still require support from their family and social environment as they have not yet acquired the skills needed to manage their condition autonomously (Luis-Rodrigo et al., 2007). Nurses must perform the care activities that children are unable to do themselves (doing for), while supporting them and their families (doing with) to become independent as quickly as possible (Henderson, 1964).

The standardized nursing languages NANDA-I, NOC, and NIC are useful for naming nursing care needs and identifying outcomes that can be achieved through nursing interventions. Their use by school nurses promotes the particular approach they advocate, simplifies recording and facilitates continuity of care (Herdman et al., 2021).

This study aims to describe the use of the nursing process and standardized nursing languages (NANDA, NOC, and NIC) by the school nurse to facilitate monitoring of the therapeutic regimen of a girl with type 1 diabetes mellitus and her caregiver.

## Description of the case

PM is a 9-year-old girl who was diagnosed with type 1 diabetes mellitus 2 years prior. Since the beginning of the academic year (in September 2016), she has been seen weekly at her school's nurse's office to monitor her chronic health problem, with self-controlled blood glucose levels within the normal range. In December 2016, she attended an annual check-up at the endocrinology department of her referral hospital, where a glycosylated hemoglobin (HbA1c) figure of 9.9 was found, which was not consistent with the capillary blood glucose levels recorded by PM. A new hospital visit is scheduled after 1 month to assess the evolution of HbA1c levels. The hospital's endocrinology department, through a medical report delivered to PM and her mother, requests support from the school nurse for the control and monitoring of PM's therapeutic regimen.

A nursing assessment is carried out based on PM's care demands and in accordance with the human needs identified by Virginia Henderson (1971). PM is on a prescribed diet of 17.5 servings of carbohydrates per day divided into four servings at breakfast, one serving mid-morning, six at lunch, 2.5 in the afternoon, and four at the evening meal. Her weight is within the 75th percentile for her age and her height is within the 50th percentile for her age. On weekdays, she uses the school canteen service, where her diet is supervised by the school nurse. The child reports that during the school day she sometimes eats food offered to her by her classmates because she is hungry. She states that she does not know how many servings of carbohydrates that means, nor whether or not she can eat those foods without restriction. Her mother says that at home, PM is not following the prescribed diet. She states that in the months following PM's diagnosis she received information on how to organize her daughter's diet and started using a scale at home to weigh her food. However, she stopped monitoring PM's diet as she "did not have the time to deal with everything." At present, she says that she has forgotten how to do it: she does not know which foods her daughter can eat without the need to weigh them and which foods need to be controlled in terms of quantity.

At recess, PM usually plays games requiring physical exercise. She does not engage in sporting activities outside of school hours.

PM wears a uniform. Her mother is aware of the importance of paying attention to the seams of clothing and shoes to prevent chafing injuries.

PM displays good body hygiene. She claims to brush her teeth once a day. She has four teeth with fillings. Her mother mentions that they have been meaning to visit the dentist for free dental check-ups for the past 2 years, but have not been able to do so because she is very busy with her work outside the home, taking care of the housework, and looking after PM and her 3-year-old brother. PM has no wounds or skin lesions.

PM is in charge of insulin administration at home, a task she performs without parental supervision. The girl reports that she sometimes lies to avoid taking some injections, believing that this will not affect her health. When asked about how she administers insulin, she reports that she does not follow any patterns for rotating the injection sites. When observing how she performs the technique, it is clear that she does not dispose of the needles after injection and does not know how to handle the waste from used equipment. In addition, during the interview, she insists that she wants to be a "normal girl," disliking the fact that her peers may see her checking her blood glucose levels or administering insulin. She says she is tired of having to control what she eats and being different from others. She notes that her classmates do not understand what is happening to her. Her mother also adds that she became "afraid of hospitals and needles" after her father's car accident almost a year earlier.

PM's mother, whose mother tongue is Spanish, works outside her home in the mornings and evenings. Following her husband's accident, she worked longer hours to support the family financially. PM's father now accompanies her to her medical check-ups. His mother tongue being Arabic makes it difficult for him to convey to his wife the information given by healthcare professionals about PM's health. On many occasions, it is PM who carries out this task. She says that sometimes she "makes it up" because she does not remember the information or because she has been told that she is not doing well and "I know mum will be angry."

PM's mother admits to being "overwhelmed" by her work and family duties. She points out that when she gets home, she has to take care of the housework, PM, and her brother. She refuses to delegate care tasks to her husband, arguing that he already fulfils his own duties. She emphasizes that it is she who must take care of her children. She says she feels "guilty" for not being able to take care of her daughter the way she used to. She says that "she cannot cope with everything" and explicitly requests "support" from the school nurse to improve her daughter's care. Her daughter is willing to change the situation and get involved in her self-care.

## Clinical reasoning process

Nursing knowledge allowed the data collected during PM's nursing assessment to be transformed into information (Herdman et al., 2021).

As a result, it was considered that the tests performed on PM revealed abnormally high levels of glycated hemoglobin, which were not consistent with the capillary blood data provided by PM. The interview and observation confirmed the girl's difficulties in the correct administration of insulin. The nurse assessment data suggested that PM was tired of following the prescribed treatment regimen, was afraid of needles, and felt uncomfortable performing self-care tasks in front of her classmates. PM had poor oral hygiene. Both she and her mother seemed to lack the necessary knowledge and strength to follow the prescribed diet. PM's mother's excessive work, family, and domestic care activities (intensified after her husband's accident) made it difficult for her to take care of her daughter's therapeutic regimen and made her feel guilty about it. PM's father was responsible for attending PM's medical check-ups. However, language barriers prevented effective communication with healthcare professionals.

The NANDA-I nursing diagnosis that was initially considered in PM's case was Ineffective health self-management (00276). This diagnosis, however, seemed to favor an individual approach, disregarding a family dynamic that was negatively affecting the management of PM's prescribed therapeutic regimen and other care activities (e.g., oral hygiene). In addition, due to PM's age (9 years old) and limited ability to autonomously manage the disease, family support was considered crucial to ensure good self-management of her illness. It was decided to select the diagnosis Ineffective family health self-management (00294), defined as "Unsatisfactory management of symptoms, treatment regimen, physical, psychosocial and spiritual consequences and lifestyle changes inherent in living with one or more family members' chronic condition" (Herdman et al., 2021, p. 218). The information obtained from the nursing assessment showed the presence of, at least, three defining characteristics of this diagnosis ("caregiver strain", "decrease in attention to illness in one or more family members" and "exacerbation of disease signs of one or more family members"). Several related factors were considered to contribute to the emergence (and maintenance) of the care problem: "competing demands on family unit," "inadequate knowledge of treatment regimen," "limited ability to perform aspects of treatment regimen," "negative feelings toward treatment regimen," and "unrealistic perception of treatment benefit."

PM's susceptibility to variation in glucose serum levels outside of the normal range resulted in her being diagnosed with Risk for unstable blood glucose level (00179), with the following risk factors: "inadequate adherence to treatment regimen," "inadequate dietary intake," and "inadequate knowledge of disease management." Her inadequate oral hygiene habits and difficulty accessing dental care were identified as factors related to the diagnosis Impaired dentition (00048), which was apparent by the presence of dental caries in PM.

The pressure on PM's mother as primary caregiver was noticeable and she reported struggling to meet PM's care needs. Initially, the diagnostic hypothesis was Stress overload (00177), given the high number of stressors she had to cope with. The final diagnosis was Caregiver role strain (00061), in view of the concerns raised by PM's mother regarding her caregiving role, her perceived difficulty in completing the required caregiving tasks, and the emotional manifestations recorded in the nursing assessment.

## Care planning and follow-up

Once the relevant nursing diagnoses had been identified and defined, they were prioritized. Due to the relationship between the related factors of both diagnoses, it was decided to first address the diagnosis Ineffective family health self-management (00294), considering that the nursing treatment for this problem would contribute to the improvement of other identified nursing care needs and that of the diagnosis Risk for unstable blood glucose level (00179). At first, addressing the diagnosis Impaired dentition (00048) was not considered a priority. Given the relationship of this diagnosis with family difficulties in tending to the care needs of its members, it was considered that actions aiming to improve the functioning of the family as a caregiving unit could help to improve the girl's access to the necessary dental care. A specific educational activity emphasizing the importance of correct dental hygiene was also incorporated into the care plan.

The school nurse's area of action, which focused on providing care at school throughout the school day, made it difficult to address PM's mother's diagnosis of Caregiver role strain (00061). However, given the importance of the caregiver's emotional state in favoring the adequate management of the therapeutic regimen, it was decided to address this diagnosis by incorporating specific activities aiming to minimize, as far as possible, the pressure perceived by PM's mother in caring for her daughter. This was done by enabling the girl to self-manage the treatment of her illness with less need for maternal supervision and by providing PM's mother with emotional support to manage her feelings of guilt, frustration, and psychological distress.

## Nursing outcomes classification

PM, her mother, and the school nurse agreed on the NOC nursing outcomes 1619-Self-management: Diabetes and 2300-Blood Glucose Level to measure the effectiveness of the nursing interventions proposed for the diagnosis Ineffective family health self-management (00294). The conceptual model informed the selection of the outcome based on the objective of promoting autonomy in PM and her mother. The outcome 2506-Caregiver Emotional Health was selected to assess the changes perceived by PM's mother after the nursing intervention. Indicators and their baseline scores were established based on the data collected in the nursing assessment (NNN Consult, 2021) (see Table 1).

## Nursing interventions classification

NIC interventions were selected based on the related factors of the aforementioned nursing diagnoses, the available scientific evidence, the feasibility of their implementation in the care setting in question (at school), their acceptance by both PM and her mother, and the school nurse's training regarding their implementation (Butcher et al., 2018) (see Table 2).

**TABLE 1** NOC outcomes and indicators identified

Nursing diagnosis	Planning			Assessment		
	Outcome		Baseline score	Target score (time)	Final score	Change score
Ineffective family health self-management (00294).	1619–Self-management: Diabetes	161901 Accepts diagnosis	2–Rarely demonstrated	5 (2 months)	4–Often demonstrated	
		161920 Follows recommended diet	2–Rarely demonstrated	5 (3 months)	4–Often demonstrated	
		161929 Uses correct procedure for insulin administration	2–Rarely demonstrated	5 (1 month)	5–Consistently demonstrated	
		161932 Uses medication as prescribed	2–Rarely demonstrated	5 (1 month)	5–Consistently demonstrated	
		161934 Rotates injection sites	2–Rarely demonstrated	5 (1 month)	5–Consistently demonstrated	
		Outcome	2–Rarely demonstrated	Increase to 5 (3 months)	4–Often demonstrated	+2
	2300 Blood Glucose Level	230004 Glycosylated haemoglobin	2–Substantial deviation from normal range	4 (7 months)	4–Mild deviation from normal range	
		Outcome	2–Substantial deviation from normal range	Increase to 4 (7 months)	4–Mild deviation from normal range	+2
Caregiver role strain (00061).	2506 Caregiver Emotional Health	250606 Guilt	2–Substantially compromised	5 (7 months)	5–Not compromised	
		250608 Frustration	2–Substantially compromised	5 (7 months)	5–Not compromised	
		250613 Perceived burden	2–Substantially compromised	4 (7 months)	4–Mildly compromised	
		250620 Psychological distress	2–Substantially compromised	4 (7 months)	4–Mildly compromised	
		Outcome	2–Substantially compromised	Increase to 4 (7 months)	4–Mildly compromised	+2

The planned nursing activities were implemented using active listening and taking into consideration the specific barriers and difficulties that PM and her mother identified in following the therapeutic regimen as recommended by scientific evidence (American diabetes association [ADA], 2021). Initially, a joint approach with the diabetes nurse educator at the hospital where PM attended her regular check-ups was considered. However, as this was not possible and was limited to occasional meetings where specific issues of the prescribed therapeutic regimen were addressed, it was agreed that the school nurse would be in charge of addressing the nursing diagnoses identified.

The girl's limitations in insulin administration were specifically addressed during the first 3 weeks of nursing care. The different types of insulin available, how to inject insulin using the pen, as well as how to safely dispose of waste were explained to her in detail. The subsequent 3 weeks were devoted to her specific approach to diet, emphasizing the importance of calculating carbohydrate servings. A list of "unrestricted" foods that she could consume specifically at times of increased appetite was reviewed with her. The school canteen menu was reviewed with her on a daily basis, so that she could choose the

foods she preferred from among the ones available as long as she followed a balanced and individualized diet. On a daily basis, this information, including how much of each food PM should take, was passed on by the school nurse to the staff in charge of meal preparation at the school (ADA, 2021; Lawrence et al., 2015).

Individualized diabetes education was provided using brief, age-appropriate educational materials. Each session included specific content tailored to PM and her mother, taking into consideration their cultural beliefs, as recommended by scientific evidence (ADA, 2021).

Finally, the complications of diabetes mismanagement and signs and symptoms of diabetes mismanagement were explained. The signs and symptoms of hypoglycemia and hyperglycemia and how to deal with them were specifically addressed.

Given the importance of physical exercise in the control and prevention of complications derived from type 1 diabetes mellitus, the available options involving aerobic physical activity for 60 min, 3 days a week, were discussed with PM (ADA, 2021). PM chose to join Zumba classes, which were held at her school and enabled her to establish new social relationships.

**TABLE 2** Interventions and activities implemented

Nursing diagnosis	Outcome	Intervention	Activities	Month 1-3	Month 4-6
Ineffective family health self-management (00294).	1619-Self-management: Diabetes	5614 Teaching: prescribed diet	Explaining to PM and her mother the importance of following the prescribed diet for diabetes control.	X	
			Informing PM and her mother about which foods are allowed or forbidden, and how much of each food she can consume.	X	X
			Including PM's food preferences in the daily school menu.	X	X
			Providing PM's mother with a list of cooked foods and their equivalents in carbohydrate servings, as well as recipe suggestions in writing.	X	
		5616 Teaching: prescribed medication	Informing PM about the effects and purposes of the different types of insulin.	X	
			Instructing PM on the criteria to be applied when deciding on administering the various types of insulin based on capillary blood glucose values.	X	
			Instructing PM on suitable injection sites depending on the type of insulin and on rotation of injection sites.	X	
			Instructing PM on how to properly care for her insulin pen.	X	
			Administering insulin as prescribed.	X	X
	2300-Blood glucose level	2120 Hyperglycemia management	Together with PM, identifying potential causes of hyperglycaemia.	X	X
			Encouraging self-monitoring of blood glucose.	X	X
			Facilitating PM's engagement in physical exercise activities leading to adherence to her exercise regimen.	X	X
		2130 Hypoglycemia management	Administering simple carbohydrates to PM when her blood glucose is below 60 mg/dl.	X	X
			Administering complex carbohydrates to PM after the administration of simple carbohydrates as recommended (Grupo de trabajo de la Guía de Práctica Clínica sobre Diabetes mellitus tipo 1 [Working Group for the Clinical Practice Guidelines on Type 1 Diabetes Mellitus], 2012)	X	X
			Reviewing episodes of hypoglycaemia with PM to identify their potential causes.	X	X
Caregiver role strain (00061)	2506-Caregiver emotional health	7040 Caregiver support	Acknowledging the difficulties PM's mother is experiencing in caring for her daughter.	X	X
			Identifying sources of respite care (i.e. PM's father)	X	
			Discussing with PM's mother her strengths and weaknesses concerning the management of her daughter's illness.	X	X
			Making positive statements about the efforts made by PM's mother to take care of her daughter.	X	X
			Informing PM's mother of local associations of individuals with DM and summer care resources for children with DM.		X

A 1-h training session was scheduled with PM's classmates, which took place during school hours. The session covered what diabetes was, what care was needed, what the complications were, and how they could help PM in case she showed any symptoms of hypoglycemia. This was intended to increase PM's support network and reduce her fear of being perceived as "different" by her peers because of her illness. This activity was also offered to teachers and other school staff,

who chose not to participate as they were already familiar with the topic.

In addition, a system of rewards for PM was established as a form of positive reinforcement. She was rewarded as she reached targets for good control of her glycated hemoglobin levels.

Glycemic controls during school hours were performed by the school nurse together with PM before meals (mid-morning and lunch)

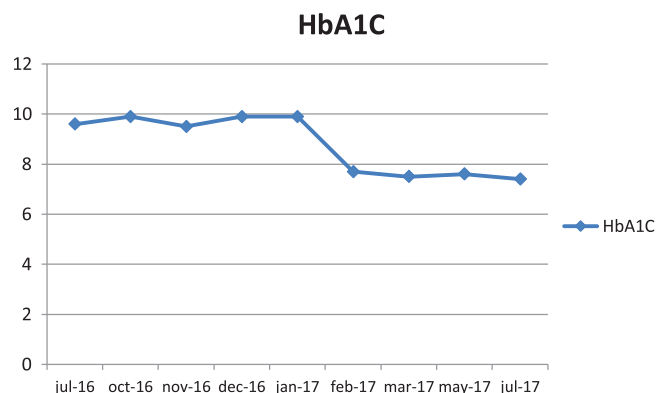
and when there were symptoms of hypoglycemia (ADA, 2021). During the time the care plan was being developed, PM had a number of episodes of hyper- and hypoglycemia. For episodes of hyperglycemia, the dose of insulin to be administered immediately afterward was readjusted. Episodes of hypoglycemia were managed following the recommendations established by scientific evidence: by providing her with simple carbohydrates (15–20g) and then complex carbohydrates (Grupo de trabajo de la Guía de Práctica Clínica sobre Diabetes mellitus tipo 1 [Working Group for the Clinical Practice Guidelines on Type 1 Diabetes Mellitus], 2012). In addition, during these episodes, specific work was done with PM on her ability to manage them, specifically on the warning signs and symptoms so that she could act appropriately when they occurred outside her school.

This timing made it possible, on the one hand, to obtain up-to-date information on the treatment prescribed to PM, as well as on the evolution of the analytical parameters for controlling the disease. On the other hand, it made it possible to quickly address any questions, as well as addressing any difficulties that may have arisen after addressing the aforementioned questions.

Specifically, in the first session scheduled with PM's mother, the fears and difficulties she expressed with regards to caring for her daughter were addressed, and the care she had provided in the past and continues to provide at present was reinforced. The possibility of sharing family and housekeeping tasks with her husband was explored, but she dismissed this option. Her dietary knowledge was probed during the sessions and any gaps that were identified were specifically addressed. Information on the number of carbohydrate servings contained in foods commonly found in PM's diet was explained and provided in writing. PM's mother was provided with the websites of the Madrid Diabetes Association and the Spanish Diabetes Federation, where she could find helpful information. In particular, the weighing of food and the importance of doing so to ensure PM's intake of the prescribed carbohydrate servings were explained to her. Meal plans were proposed and questions regarding their preparation were addressed. The progress made by PM in managing her disease and the improvement in glycated hemoglobin levels were pointed out to her mother, reinforcing the importance of the caregiving activities she was carrying out to help PM achieve optimal control of her disease. In one of the last sessions, the mother expressed fear about the arrival of the summer holidays, as not having the support of the school nurse could negatively affect PM's adherence to treatment. As a result, the school nurse provided the mother with various community resources that would be available during that time that could support her and her daughter, including the possibility of attending summer camps organized by the Madrid Diabetes Association.

## ASSESSMENT

Indicators were assessed during the scheduled sessions with both PM and her mother. For outcome 1619-Self-management: Diabetes, the target score was achieved for indicators linked to correct insulin administration, including rotation of injection sites and adherence to



**FIGURE 1** HbA1C values over time

the prescribed regimen. The final scores for acceptance of the diagnosis and adherence to the recommended diet were lower than planned. These outcomes may take longer to achieve and may also fluctuate depending on the time at which they are assessed. Patients do not always stay at the same point of acceptance throughout the course of their illness. Times of celebration also influenced PM's diet, causing her to become somewhat unconcerned by it, thus making it necessary to reinforce diet education at times of celebration.

With regard to blood glucose levels, PM experienced several episodes of hypoglycemia during the months of December, January, and February, which made it necessary to readjust the medical treatment prescribed by the Endocrinology Department of the referral hospital. The episodes PM experienced at school were not serious and were treated at school without the need for medication. Taking as a reference the glycated hemoglobin figures provided by the blood tests carried out with PM at the hospital, the HbA1c figures stabilized from March onward, remaining close to 7, as is recommendable according to the scientific evidence (ADA, 2021), 7 months after starting the implementation of the care plan (see Figure 1). The improvement in HbA1C values was used in several sessions with PM and her mother as positive reinforcement for their efforts in making the changes they were making.

In relation to the diagnosis Caregiver role strain (00061), changes in the indicators of outcome 2506-Caregiver Emotional Health suggested progress was being made. Progress in PM's self-management of the disease made it possible to relieve her mother of certain caregiving tasks. Good results in analytical controls were essential to reducing the stress experienced by her mother. In any case, the difficulty in addressing issues concerning family functioning (in terms of the distribution of care responsibilities between parents) negatively affected the chances of reaching the initially planned target score.

## DISCUSSION AND IMPLICATIONS FOR PRACTICE

The improved nursing outcomes agreed with PM and her mother highlight the importance a school nurse has in addressing issues related to the management of chronic disease treatment regimens.



The World Health Organization (OMS [WHO], 2003) and the United Nations Educational, Scientific, and Cultural Organization (Delors, 1997) point out that schools are undoubtedly a favorable place for the implementation of generic health education actions (focused on the school population in general) and specific health education actions (in the case of identifying particular care needs in some members of the school population).

The case presented above aims to highlight the way in which school nurses can support the care of chronically ill individuals in collaboration with other levels of care, such as hospital care, by becoming a reference figure in the control and management of the prescribed therapeutic regimen. This case also highlights the importance of adopting a joint approach together with PM's primary caregiver, in this case her mother, by incorporating specific actions aimed at her into the care plan while taking into consideration the care setting where nursing activities are to be carried out, in this case the school. Therefore, it is vital to agree with parents the specific times and spaces for caregiving in order to encourage their participation and involvement in the care plan. Finally, it is also essential to take into consideration other key figures in school life, such as teachers and classmates, by implementing specific activities aimed at training them in the care of chronically ill children, in particular with regards to the identification of warning signs requiring immediate health care.

The case described in this article highlights the need to establish common protocols for action in the school setting and in the different healthcare settings. These protocols would outline common care guidelines and channels of communication between school nurses, specialist diabetes nurses, and primary care nurses, ensuring continuity of care for children with chronic conditions.

## ACKNOWLEDGMENT

To Angel Martín-García, Pedro Ruymán Brito-Brito, Almudena Alameda-Cuesta, and María Teresa Alcolea-Cosín for their comments to improve this manuscript.

## CONFLICT OF INTEREST

The authors declare no conflict of interest.

## ETHICS STATEMENT

The participant who agreed to participate voluntarily signed the Free and Informed Consent Form.

## AUTHOR CONTRIBUTIONS

All authors have contributed to and approved the final version of this case study.

## ORCID

Cristina Oter-Quintana RN, MD  <https://orcid.org/0000-0002-2192-5120>

Juana Robledo-Martín RN, PhD  <https://orcid.org/0000-0003-1616-1442>

## REFERENCES

- American Diabetes Association. (2021). 13. children and adolescents: Standards of medical care in diabetes-2021. *Diabetes Care*, 44(Suppl 1), S180–S199. <https://doi.org/10.2337/dc21-S013>
- Butcher, H. K., Bulechek, G. M., Dochterman, J. M., & Wagner, C. M. (2018). *Nursing interventions classification (NIC)*. Elsevier.
- Dai, H., Chen, Q., Huang, H., Wu, K., & Yang, X. (2022). The role of nurses in taking care of children with type 1 diabetes. *Alternative Therapies in Health and Medicine*, 28(1), 107–113.
- Delors, J. (1997). La educación encierra un tesoro: Informe para la UNESCO de la Comisión Internacional sobre la Educación para el Siglo Veintiuno. UNESCO. [Learning: The treasure within; report to UNESCO of the International Commission on Education for the Twenty-first Century]. [https://unesdoc.unesco.org/ark:/48223/pf0000109590\\_spa.locale=es](https://unesdoc.unesco.org/ark:/48223/pf0000109590_spa.locale=es)
- Grupo de trabajo de la Guía de Práctica Clínica sobre Diabetes mellitus tipo 1 [Working Group for the Clinical Practice Guidelines on Type 1 Diabetes Mellitus]. (2012). Guía de Práctica Clínica sobre Diabetes mellitus tipo 1. Plan de Calidad para el Sistema Nacional de Salud del Ministerio de Sanidad y Política Social. Agencia de Evaluación de Tecnologías Sanitarias del País Vasco-Osteba. [Clinical practice guidelines on type 1 diabetes mellitus. Spanish ministry of health and social policy quality plan for the national health system. OSTEBA-Basque office for health technology assessment]. [https://portal.guiasalud.es/wp-content/uploads/2018/12/GPC\\_513\\_Diabetes\\_1\\_Osteba\\_compl.pdf](https://portal.guiasalud.es/wp-content/uploads/2018/12/GPC_513_Diabetes_1_Osteba_compl.pdf)
- Henderson, V. (1964). The nature of nursing. *The American Journal of Nursing*, 64(8), 62–68. <https://www.jstor.org/stable/3419278>
- Henderson, V. (1971). *Principios Básicos de los Cuidados de Enfermería*. Consejo Internacional de Enfermería. [Basic Principles of Nursing Care].
- Herdman, T. H., Kamitsuru, S., & Lopes, C. T. (Eds.). (2021). *Nursing diagnoses. Definitions and classification*. 2021–2023 (12th Edition). Thieme Medical Publishers, Inc.
- NNNConsult [database]. (2021). NNNConsult [database]. <http://www.nnnconsult.com/>
- Lawrence, S. E., Cummings, E. A., Pacaud, D., Lynk, A., & Metzger, D. L. (2015). Managing type 1 diabetes in school: Recommendations for policy and practice. *Paediatrics & Child Health*, 20(1), 35–44. <https://doi.org/10.1093/pch/20.1.35>
- López Langa, N., González Prieto, N. I., & López Gutiérrez, I. (2015). *Competencias profesionales de la Enfermería Escolar*. [Professional competences of School Nursing]. Madrid Association of School Nurses (AMECE). <https://www.codem.es/documentos-2/competencias-profesionales-de-enfermeria-escolar>
- Luis Rodrigo, M. T., Fernández Ferrín, C., & Navarro-Gómez, M. V. (2007). *De la teoría a la práctica. El pensamiento de Virginia Henderson en el siglo XXI*. [From theory to practice. Virginia Henderson's ideas in the 21st century]. (3rd ed.) Masson.
- Martinez, K., Frazer, S. F., Dempster, M., Hamill, A., Fleming, H., & McCorry, N. K. (2018). Psychological factors associated with diabetes self-management among adolescents with Type 1 diabetes: A systematic review. *Journal of Health Psychology*, 23(13), 1749–1765. <https://doi.org/10.1177/1359105316669580>
- Neu, A., Bürger-Büsing, J., Danne, T., Dost, A., Holder, M., Holl, R. W., Holterhus, P. M., Kapellen, T., Karges, B., Kordonouri, O., Lange, K., Müller, S., Raile, K., Schweizer, R., Sengbusch, S. V., Stachow, R., Wagner, V., Wiegand, S., & Ziegler, R. (2019). Diagnosis, therapy and follow-up of diabetes mellitus in children and adolescents. *Experimental and Clinical Endocrinology & Diabetes: Official journal, German Society of Endocrinology [and] German Diabetes Association*, 127(S 01), S39–S72. <https://doi.org/10.1055/a-1018-8963>
- Siminerio, L. M. (2015). Diabetes education and support: A must for students with diabetes. *NASN School Nurse (Print)*, 30(6), 320–321. <https://doi.org/10.1177/1942602X15608685>

- World Health Organization. (2003). *Skills for health: Skills-based health education including life skills: An important component of a child-friendly/health-promoting school*. [http://www.who.int/school\\_youth\\_health/media/en/sch\\_skills4health\\_03.pdf](http://www.who.int/school_youth_health/media/en/sch_skills4health_03.pdf)
- Wang, Y. L., Brown, S. A., & Horner, S. D. (2013). The school-based lived experiences of adolescents with type 1 diabetes. *The Journal of Nursing Research: JNR*, 21(4), 235–243. <https://doi.org/10.1097/jnr.000000000000003>

**How to cite this article:** Nombela-Franco, A., Oter-Quintana, C., & Robledo-Martín, J. (2022). Case Study: School-based care for a girl and her primary caregiver experiencing difficulties in managing diabetes treatment. *International Journal of Nursing Knowledge*, 1–8. <https://doi.org/10.1111/2047-3095.12373>