

Improving the quality of nursing care through standardized nursing languages: Call to action across European countries

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ABSTRACT

Background: Standardized Nursing Languages (SNLs) have enabled nursing assessments and care to be better documented and visible in electronic health records (EHRs). However, its implementation is challenging and heterogeneous across clinical settings. This study aimed to demonstrate the challenges experienced by members of a European nursing organization, ACENDIO, in implementing SNLs in documentation systems across countries and offer recommendations about its use.

Material and methods: The study was executed in two phases. First, an online survey was distributed among ACENDIO members. Second, members participated in two expert panels. Discussions were recorded, and thematic analysis was performed to formulate challenges and recommendations on the use of SNLs.

Results: The findings highlight that nurses across Europe are faced with several issues with current documentation systems in clinical settings, limited education on SNLs, and challenges in research on SNLs. Nurses, managers, vendors, educators and researchers should work closely together to face the challenges in the implementation of SNLs in electronic documentation systems.

Conclusion: To fully utilize the beneficial effects of the use of SNLs, the call to action is to develop comprehensive collaborations of nursing practice, education, and research.

1. Introduction

Standardized nursing languages (SNLs) are a common language for nurses based on nursing practice and science and represent the body of nursing knowledge, which describes nurses' responsibility and unique contributions to patients' health. [1,2] SNLs aim to provide explicit terminology to the phenomena associated with nursing practice. The development of SNLs began in the 1970s, and by 1989, the American Nursing Association (ANA) had established a process to endorse languages, vocabularies, and terminologies to nursing practice.[3] Similarly, the European Federation of Nurses Associations has advocated care plans incorporating SNLs and aligning with international

taxonomy.[4].

SNLs were developed and refined for nursing diagnoses, interventions, and patient goals/planned outcomes to capture the nursing care process and its outcomes for practice, research, and policy purposes.[5] Advanced Nursing Process refers to the application of SNLs within the nursing process, emphasizing the use of evidence-based classifications.[2,6] Since SNLs have been incorporated into nursing documentation systems, studies have demonstrated that care plans coded with SNLs simplify the documentation, track patient outcomes, and improve the quality of care.[2,6–10].

Nonetheless, the role of SNLs and the implementation of semantic interoperability standards in electronic health records (EHRs) remains

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challenging. To overcome these challenges and reach a consensus on the use of SNLs at an international level, the European nursing organization Association for Common European Nursing Diagnoses, Interventions and Outcomes (ACENDIO) has a mission to promote a global network for developing SNLs, information systems, and eHealth technologies.[11] Fig. 1 shows ACENDIO, from its foundation in 1995 to its worldwide contributions to research, clinical practice, and education to support and advance nursing.

This article aims to demonstrate the challenges experienced by ACENDIO members in the implementation of SNLs across countries and offer recommendations about the use of SNLs. We sought to answer the following research questions: What are the perceived challenges of using SNLs encountered by ACENDIO members across different countries? How do ACENDIO members recommend further implementation of SNLs?

2. Material and methods

Within the ACENDIO network, a working group of international nursing researchers is actively working on implementing SNLs. They developed a survey and organized two expert panels during two ACENDIO conferences: a Biennial Workshop and General Assembly (St. Pölten, April 21, 2022)[12] and the 14th ACENDIO Conference (Rome, March 16 – 18, 2023).[13].

2.1. Survey

The survey was conducted to uncover the challenges that ACENDIO members experience with the use of SNLs across various countries. A group of six international researchers created a survey based on a previous questionnaire[14] and the Office of the National Coordinator for Health Information Technology.[15] This questionnaire collected 1) demographic data of members, 2) their experiences with SNLs in EHRs, the usefulness of SNLs in nursing care documentation, and national efforts towards SNL adoption, and 3) a section for open-ended feedback.

An email invitation containing a link to the questionnaire was sent to 26 ACENDIO members. Eligibility was determined through a two-step process. First, we reviewed the professional profiles of the ACENDIO members to identify those who have actively participated in projects or committees related to SNL implementation in their home countries. Second, we included members who have (co-)authored publications on SNLs in peer-reviewed journals. These criteria were intended to select members whose professional or research activities demonstrated substantial experience with SNLs. We received a total of 17 responses (response rate of 65.4 %) across 14 countries, primarily from Europe (n = 12), Brazil (n = 1), and the United States (n = 1). We sent two

reminders in an interval of three weeks following the initial invitation. Despite these follow-up efforts, the response rate remained moderate and may have been influenced by potential time constraints. The responses were analyzed descriptively and used to lead the discussions in the following expert panels.

2.2. Expert panels

Two expert panels were organized by the working group during the conferences held in 2022 and 2023, respectively. The panels consisted of convenience sampling of attendees at both conferences, totaling 147 experts. This sample comprised professionals from diverse backgrounds, including researchers, clinical nurses, data scientists, informaticians, advocates, and educators. These participants were selected for their experiences in the use of SNLs to enhance the quality of nursing care. This convenience sampling approach ensured a comprehensive representation of perspectives across countries, enriching the discussions. The panel discussions were recorded and analyzed by using the principles of inductive, thematic analysis[16] to look for patterns of interest. Two reviewers independently analyzed the materials by following the steps of thematic analysis: familiarization with data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and reporting. The reviewers compared the codes, themes, and interpretations from their analysis. Any disagreement was noted and resolved through discussion among the reviewers. The final step involved narrative and contextualization of the analysis in relation to existing literature in SNLs.

3. Results

The findings derived from survey responses and group discussions among ACENDIO members highlight challenges and provide recommendations for the use of SNLs. These insights are categorized into three main themes: nursing practice, nursing education, and research. A brief description of each theme appears in the following section.

Nursing Practice: ACENDIO members have identified several challenges that nurses face in their daily routines, particularly with the documentation system. These systems often involve predominantly unstructured notes that contain redundant and ambiguous clinical information. Additionally, members have identified the burdensome nature of documentation as a contributor to their high workload.

“Lack of clinical decision-making skills, lack of awareness of SNLs importance... deficiencies in IT, cumbersome entry and time-consuming ...” (Member 1).

“Reliability of unstructured data inserted by nurses is challenging.” (Member 3).

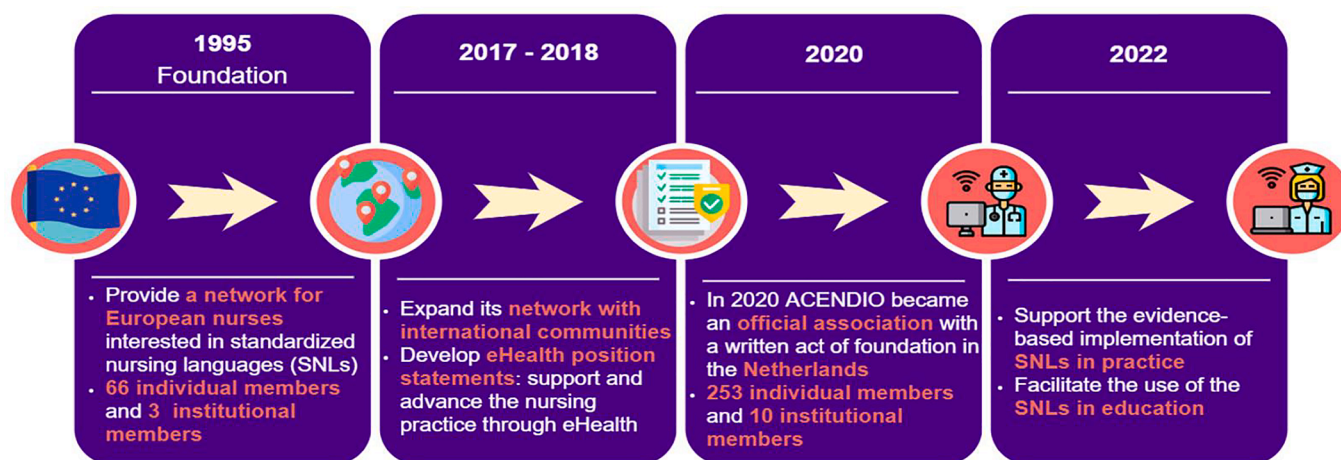


Fig. 1. The illustration shows the contributions of ACENDIO to nursing practice, education, and research since 1995.

Table 1
Challenges and Call to Action on the use of SNLs across countries.

	Nursing Practice	Nursing Education	Research
Challenges	<p>Issues with current documentation systems: Cumbersome nursing documentation:</p> <ul style="list-style-type: none"> • The process of recording and managing patient information is complicated and time-consuming. • The majority of the clinical information is not structured, making it difficult to extract meaningful insights. • Clinical information is recorded multiple times and abbreviations used are often unclear, leading to misinterpretation and potential risks to patient care. • Predominant use of medical diagnoses: • Medical diagnoses are primarily used for decision-making and care planning, overlooking the importance of nursing diagnoses. <p>Challenges with implementing SNLs in EHRs:High costs of implementation and translation:</p> <ul style="list-style-type: none"> • Integrating SNLs into EHR systems requires a significant investment of resources and translation efforts. <p>Lack of interoperability:</p> <ul style="list-style-type: none"> • There are challenges in ensuring that SNLs can be easily integrated across different EHR systems. • Limitations on documentation systems link nursing classifications (nursing diagnoses, interventions, and outcomes) to SNOMED CT (medical terms). <p>Unclear benefits:</p> <ul style="list-style-type: none"> • The advantages of using SNLs for care plan are not well-defined and understood by nurses and other clinicians. 	<p>Issues with current education on SNLs:</p> <ul style="list-style-type: none"> • SNLs learned in nursing education are divergent from terminologies used in nursing practice. • Documentation systems used in nursing education are divergent from those used in nursing practice. • Students learn about SNLs during nursing school but return to narratives when starting to work in nursing practice. • Collaboration between schools and care organizations for training nurses in SNLs needs to be improved. 	<p>EHR data quality:</p> <ul style="list-style-type: none"> • The quality of data currently needs to be improved to measure the impact of nursing care on patient outcomes accurately. <p>Funding:</p> <ul style="list-style-type: none"> • Funding for research on implementing SNLs is limited to date. <p>Organizations and network:</p> <ul style="list-style-type: none"> • There is a fragmented network (academic and non-academic) in advocating SNLs.
Call to Action	<p>Identification of stakeholders' efforts:Nurses:</p> <ul style="list-style-type: none"> • Nurses should actively participate in the integration process, providing valuable insights based on their experience and needs. • Engage in training programs to become experienced in using SNLs. <p>Managers:</p> <ul style="list-style-type: none"> • Managers should allocate necessary resources and support to facilitate the integration of SNLs. • Encourage collaboration between different departments. • Foster a culture that values standardization and invests in necessary resources for SNLs implementation. <p>Vendors:</p> <ul style="list-style-type: none"> • Vendors should work closely with clinical settings to customize EHR systems according to their specific needs, ensuring smooth integration of SNLs. • Offer technical support and training programs to assist nurses in adapting to the new system. <p>Policy, legislation, and guidelines:</p> <ul style="list-style-type: none"> • Develop and implement policies and guidelines that encourage the use of SNLs in clinical settings. • Advocate for legislation that supports the adoption of SNLs, ensuring it becomes a standard practice across clinical settings. 	<p>Improve education on SNLs:</p> <ul style="list-style-type: none"> • Align SNLs taught in nursing education to be used in nursing practice. • Use real practice examples with SNLs in nursing education. • Educate the instructor by training in nursing practice with experts on SNLs. • Enable continuing education on SNLs. <p>Facilitate education in SNLs in nursing practice:</p> <ul style="list-style-type: none"> • Invest in training programs and educational resources to assist nurses in adapting to new documentation systems. 	<p>Evidence in SNLs:</p> <ul style="list-style-type: none"> • Rigorous studies should be conducted to evaluate the benefits of incorporating SNLs in documentation systems, utilizing the results to enhance decision-making processes and improve patient care. <p>Funding:</p> <ul style="list-style-type: none"> • Provide more financial incentives and resources that will facilitate research on the implementation of SNLs in EHRs. <p>Organizations:</p> <ul style="list-style-type: none"> • Nurses and other clinicians should actively seek membership in nursing organizations or healthcare networks that are at the forefront of advocating for the adoption of SNLs.

Abbreviations: SNLs: Standardized Nursing Languages. EHR: Electronic Health Record.

“Some medical record systems have the ability to create automatic recording methods, while others use a tick-box system. Some systems use headings, with nurses recording all the different activities under one heading, it often gets confused.” (Member 11).

ACENDIO members have also reported challenges with implementing SNLs in EHRs, including high implementation and translation costs, a lack of interoperability, and unclear benefits.

“Lack of knowledge (e.g., about evidence/validity), expensive licensing fees, linkages between SNLs (e.g., NANDA, NIC, NOC), that

software vendors provide reasonable interfaces, integrating SNLs as databases into different IT systems.” (Member 1).

Nursing Education: In this theme, members highlight gaps in integrating SNLs within nursing education, suggesting that nurses need more training and understanding of their practical application and importance. This suggests a systemic issue in nursing education and practice, where the benefits of SNLs are not effectively communicated or valued, impacting their use in clinical settings.

“Unfortunately, not all higher nursing education programs focus on

SNLs and their evidence, and the biggest lack of knowledge is in nursing management, who often does not really support their use, nor do they see the possibilities of outcome and quality measurements.” (Member 3).

“Low uptake because practicing nurses are not trained and not aware of how to and why to use SNLs.” (Member 9).

Research: In this theme, ACENDIO members report limited funding opportunities for projects implementing SNLs and that funded studies could provide concrete evidence of nursing care’s effectiveness, showcase its critical role in healthcare, and support the broader adoption of SNLs to enhance patient care and health outcomes.

“The use of the SNL data in research to validate the outcomes might represent the impact of nursing care in populations’ health.” (Member 8).

“We need more financial incentives to advance research in nursing languages.” (Member 3).

Table 1 categorizes each theme by outlining the challenges and recommendations for improving the understanding and visibility of SNLs across clinical settings, educational practices, and research.

4. Discussion

This research has highlighted challenges across countries associated with the implementation of SNLs in different aspects of healthcare, ranging from nursing practice and education to EHR systems and research. In the context of nursing practice, ACENDIO members identify problems with current nursing documentation systems, such as cumbersome documentation and the predominant use of medical terminology that overlooks the importance of nursing terminology. These findings corroborate with other studies in the field, underscoring that cumbersome documentation leads to inefficiencies, consumes time that could otherwise be spent on direct patient care, and can also lead to a documentation burden for nurses.[17–20] For instance, studies [17,21–23] showed that EHR configurations intended to support regulatory compliance and quality improvement have intensified the workload of nurses and other clinicians, particularly with unstructured notes and administrative tasks related to non-care-related documentation. To address this issue, further studies should assess which specific EHR features contribute to the documentation burden and explore how these systems can be optimized to support SNL documentation.

ACENDIO members have also identified challenges associated with implementing SNLs in EHRs, including the high costs of implementation and translation and interoperability issues. Notably, our findings suggest that the important financial burdens related to implementing and translating SNLs within European documentation systems have not been widely recognized. This gap in the nursing literature underscores the need for comprehensive solutions to facilitate SNL integration in practice. Future studies should thus consider exploring how to reduce these financial conditions, improve system compatibility for nursing documentation, and enhance their ability to disseminate relevant information.

Evidence shows that documentation coded with SNLs serves as a foundation for evidence-based nursing by providing a structured format for recording nursing observations and care. This classification-based and structured documentation aids nurses by making it easier to gather patient data for healthcare delivery. [6,24,25] Furthermore, it supports nurses in making data-driven decisions that enhance patient care and safety, which is the cornerstone of evidence-based practice. [26] By ensuring that the nuances of nursing care are accurately captured and readily available in EHRs, SNLs contribute to a body of knowledge that continuously informs clinical practice, offering a promising future for nursing care.

Other potential benefits of implementing and using SNLs in EHRs are more accurate tracking of nursing interventions and their impact on patient outcomes.[7–10,27,28] It facilitates benchmarking against best practices and enables healthcare organizations to identify trends, measure the efficacy of nursing care, and tailor interventions to improve

patient care.[29] Moreover, the ability to extract and utilize this data can inform policy-making and resource allocation, leading to system-wide enhancements in patient care quality. Therefore, it is important for nurses, as the primary users, to be actively engaged in the integration process alongside managers and vendors. Comprehensive training in SNLs is also required to ensure their adoption becomes standard practice across all clinical settings.

The 2021 report from the European Union emphasizes the importance of understanding how EHRs and related standards are implemented, translated, and used in clinical practice. This knowledge is crucial for identifying and overcoming barriers to adoption and effective use in specific clinical contexts.[30].

Additionally, ACENDIO members have identified a gap between the SNLs taught in educational settings and their application in clinical practice.[31] For instance, the SNLs and documentation systems used in education differ from those used in practice. In some countries, the Advanced Nursing Process is utilized, incorporating SNLs into education and EHRs.[32] However, other countries still need to adopt this approach.[32,33] There is a general lack of awareness regarding SNLs and the importance of using them to document nursing interventions, assessments, outcomes, and continuity of care.[34].

Most of the solutions mentioned by members point towards improving the collaboration between schools for nursing education and care organizations. Ways to achieve this are to have instructors train nursing students in their practice environment (e.g., on a ward) and to educate new instructors by experts from nursing practice.[17,35].

In discussing the theme research, ACENDIO members underscored the importance of funded research in leveraging SNL data. In response, they recommend a coordinated effort within the research community to conduct comprehensive studies that assess the advantages of integrating SNLs into documentation systems. Such studies could explore areas such as knowledge-based clinical decision support for developing nursing care plans[8,36] or the creation and evaluation of AI-driven decision support tools for documentation tasks.[37,38] By leveraging these results, the aim is to enhance decision-making processes and advance the quality of nursing care. Additionally, research leveraging SNL data can significantly enhance the visibility of nursing by measuring its contributions to patient and health system outcomes, thereby promoting the advancement of the nursing field.[6,9,10,28].

4.1. Limitations

Even though our study provides a comprehensive overview of the challenges associated with the use and implementation of SNLs across various European countries, limitations must be considered. First, the distribution of survey respondents varied, with most countries represented by only one or two participants. It is important to highlight that analyzing such small samples separately may be challenging and not capture each country’s unique aspects. Second, our analysis revealed that the challenges faced by ACENDIO members were broadly similar across different regions. Consequently, we opted to focus on these shared challenges, aiming to offer broadly relevant recommendations that can be applied across multiple contexts. Third, this study contains small and convenience sampling. Further studies involving a larger, more geographically balanced sample would be recommended to facilitate a detailed exploration of country-specific challenges.

5. Conclusion

To fully utilize the beneficial effects of the use of SNLs, comprehensive collaborations of nursing practice, education, and research are needed. Therefore, we call upon nurses, researchers, nursing informaticians, and educators to actively seek involvement in organizations or networks that are at the forefront of advocating for the use of SNLs.

6. Summary table

Problem	<ul style="list-style-type: none"> Although SNLs have improved the documentation and visibility of nursing assessments and care in EHRs, their implementations are challenging and heterogeneous across clinical settings.
What is already known on this topic	<ul style="list-style-type: none"> SNLs provide explicit terminology to the phenomena associated with nursing practice. The European Federation of Nurses Associations has advocated care plans incorporating SNLs.
What this paper adds	<ul style="list-style-type: none"> Challenges and recommendations for the use of SNLs across European countries are categorized into three main themes: Nursing Practice, Nursing Education, and Research.

CRediT authorship contribution statement

Fabiana Cristina Dos Santos: Writing – review & editing, Writing – original draft, Supervision, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Fabio D’Agostino:** Writing – review & editing, Methodology, Investigation, Conceptualization. **Mikko Härkönen:** Writing – review & editing, Supervision, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Renate Nantschev:** Writing – review & editing, Methodology, Investigation, Formal analysis, Data curation. **Bente Christensen:** Writing – review & editing, Methodology, Investigation, Conceptualization. **Maria Müller-Staub:** Writing – review & editing, Methodology. **Kim De Groot:** Writing – review & editing, Writing – original draft, Supervision, Methodology, Investigation, Formal analysis, Data curation, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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