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### **ABSTRACT**

**Background.** Data generated by healthcare organizations can improve the quality of healthcare delivery and reduce the associated costs. As part of such health records, nursing information systems aim to improve data collection and storage methods to enhance the efficiency of decision-making processes—in both clinical and management fields. Based on such systems, a nursing minimum dataset (NMDs) identify and operationalize a standardized dataset representing the core components of nursing care. The dataset comprises nursing diagnosis (ND), interventions, and outcomes. ND can completely synthesize the nursing diagnostic process and should be adopted by nurses as the means to enhance and structure the informal professional language. Studies on ND are needed to compare patients across different clinical settings and to monitor changes over time. Moreover, if ND is prognostically related to patients or organizational outcomes, their attribution and documentation may become even more important for clinical and organizational purposes.

**Aims.** The aims of this doctoral programme were: 1) to investigate how the impact of ND on patients and organizational outcomes was already studied, with which results, and with which level of evidence; and 2) to describe through nursing information systems: a) the prevalence and the relationship between hospital outcomes and ND in acute hospital facilities; b) the prevalence and distribution of patient needs and interventions in a clinical nursing-led unit.

**Methods.** This doctoral programme was part of a wider project to develop and implement a nursing information system (professional assessment instrument) to support clinical practice, improve the nursing research potential, and enhance the visibility of nursing contributions to healthcare. For each of the above-mentioned aims, a different study was performed. To reach the first aim, a systematic literature review was conducted. The second aim was pursued through a prospective observational study, while a descriptive-comparative design was used for the third aim.

**Results.** Seventeen studies were included in the systematic literature review, which were categorized according to their methodological quality (low, good, or high) and classified based on their levels of evidence on a scale of 1 (strongest evidence) to 5 (weakest evidence). Eleven studies were classified as low, five as good, and one as high quality. The evidence levels were rated as 2 for one study, 3 for two studies, 4 for nine studies, and 5 for five studies. ND was found to predict patient (quality of life, mortality) and organizational (length of hospital stay, hospital charges, amount of nursing care, discharge dispositions) outcomes. Patient care plans based on ND improved the quality of sleep, quality of life, and glycaemic control. When added to the information derived from disease-based classification systems (e.g. diagnosis-related groups), ND actually improved the predictions of the above outcomes.

The observational study analysed 2,283 patients in four in-patient units using the PAI and hospital discharge register. An average of 4.5 NDs per patient was identified on admission—this number shows a statistically significant difference among inpatient units and medical diagnosis. NDs with a higher prevalence included Risk for infection and Risk for impaired skin integrity. NDs with a prevalence higher or equal to 20% were considered as 'high-frequency'. NDs with statistically significant relationships with either higher mortality or length of stay were considered as 'high-risk'. Six NDs were classified as high-frequency/high-risk. There was no correlation between NDs and a patient's gender and age. A statistically significant perfect linear association was observed between the number of NDs and the length of stay and the mortality rate.

The descriptive-comparative study was carried out in a nursing-led unit caring for patients affected by chronic diseases. A sample of 290 patients was included. The most frequent reason for admission was the need to receive a medium-high level of nursing care. The most prevalent NDs were Bathing self-care deficit and Impaired physical mobility. The hypertensive heart disease was the most recurring medical diagnosis. The patient dependency level, as measured by the Barthel index, improved significantly from admission to discharge. The results demonstrated that care provided by this unit can contribute to reducing hospital admission and achieving nursing-sensitive patient outcomes.

Discussion/Conclusion. Although still supported by a few high-quality studies, ND identified by standardized terminologies has great potential to be an independent predictor of a wide category of outcomes related to patient and organizational aspects of healthcare. ND describes important aspects of patient care which are not intercepted by medical diagnosis. The number and patterns of NDs can measure the degree of nursing complexity. ND identified on admission is associated with key hospital outcomes such as the length of stay and the mortality rate. The initial nursing diagnostic pattern may allow not only nurses but all members of the healthcare team to make a prognosis (towards hospital stay, mortality, or level of dependency on discharge), leading to personalization of the nursing process and the allocation of staffing resources.

A deeper and more systematic integration of relevant medical and nursing data in electronic health records is strongly needed to determine the real contribution of each variable to the different outcomes and the quality of healthcare systems. The documentation of such data is strategic—both for clinical and management aims.

Keywords: Electronic health records, nursing information system, standardized nursing terminology, nursing minimum dataset, nursing diagnosis, outcome.