Forecasting Informatics Competencies for Nurses in the Future of Connected Health
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Opportunity and Approach for Implementation of a Self-Assessment Tool: Nursing Informatics Competencies for Nurse Leaders (NICA-NL)

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Abstract. The changing environment of healthcare and the increasing reliance on technology to drive and evaluate change requires efficient tools to assess and educate nursing leadership on the skills necessary to succeed in their leadership roles. Using the Nursing Informatics Competencies for Nurse Leaders (NICA-NL) Scale as an example, this chapter will explore how such a tool can be implemented and provide value to healthcare organizations, as well as advance nursing practice.

Keywords. Self-assessment tool, Nurse Leader, Informatics Competencies

1. Introduction

The role of the Nurse Leader is continuously demanding greater in-depth knowledge and skills related to nursing informatics, as discussed in section D chapter 1 of this book. Healthcare organization-based Nurse Leaders include Chief Nursing Officers, Directors of Nursing, and Nurse Managers. Individuals in these roles are engaged in a wide breadth of activities, ranging from planning EHR training curriculums to identifying strategic initiatives for innovation. Baseline knowledge of informatics is important to guide the Nurse Leader's work, particularly as advances in nursing practice become increasingly intertwined with innovation.

2. Background

The Nursing Informatics Competencies for Nurse Leaders (NICA-NL) Scale is a validated self-assessment competency tool for Nurse Leaders that has undergone extensive development and validation.[1]. The tool consists of 26 items that group into 6 factors (Strategic Implementation Management, Advanced Information Management and Education, Executive Planning, Ethical and Legal Concepts, Information Systems

Concepts, Requirements and System Selection).[1] The NICA-NL tool has been copyrighted and is available for use, and can be accessed here [1] or by contacting the authors. In previous work, our team identified that the majority of Nurse Leaders surveyed have learned informatics knowledge and skills 'on the job' or through 'self-learning'. Tools that can be applied to the Nurse Leader's practice, and are accessible as part of a suite of educational resources provided to the Nurse Leaders by his or her employer, have the potential for wide-spread adoption and impact.

3. Application of NICA-NL at health care organizations

3.1. Vision

Nurse Leaders comprise a large portion of middle to upper management leadership positions throughout healthcare organizations, with titles such as Nurse Manager, Nurse Director, and Nurse Executive. Given that the Nurse Leader's primary focus is not on nursing informatics, it is important to understand why we need a self-assessment tool focused on Nursing Informatics Competencies for Nurse Leaders. Nursing management and practice can no longer be separated from informatics and the pervasive use of technology and data to deliver, evaluate, and improve healthcare. Given the limited available time and resources of Nurse Leaders and their organizations, efforts to increase competency skills and knowledge need to be relatively low-intensity, scalable, and sustainable. Low-intensity interventions that can be delivered to large numbers of people may have a more pervasive impact than more efficacious interventions that require greater resources.[2]

In this chapter we provide an overview of one approach that can be used to implement a validated informatics self-assessment tool, the NICA-NL, and discuss opportunities NICA-NL could provide for healthcare organizations and more broadly nursing management and practice. The RE-AIM framework (Reach, Efficacy, Adoption, Implementation, and Maintenance) has been used to guide the implementation and evaluation of innovations in public health, informatics, and nursing. [2] The use of this framework provides an incremental path and guidance to achieve and measure increased informatics competency levels of Nurse Leaders at an organization.

3.2. Implementation Framework

The RE-AIM framework states that the impact and sustainability of an intervention should be evaluated based on its: 1) Reach, 2) Efficacy, 3) Adoption, 4) Implementation, 5) and Maintenance. Here we provide an overview of how the NICA-NL could be implemented at a healthcare organization using the RE-AIM framework. [2]

- **R**each: Who is the intended, target audience for NICA-NL?
- **E**fficacy or effectiveness: What outcomes/impacts could you observe at your organization?
- **A**doption level: How many Nurse Leaders have used the tool at your organization?

- **I**mplementation consistency, costs and adaptations made during delivery: What resources are needed to implement the NICA-NL?
- **M**aintenance of intervention effects in individuals and settings over time: How are NICA-NL re-assessments performed for new and existing Nurse Leaders?

3.2.1. Measuring potential for impact on organization

There are many nursing leaders at any given healthcare organization. Some Nurse Leader roles provide input into strategic plans for their organizations, others execute the management of staff nurses at the bedside. Understanding the varied Nurse Leader roles at your organization and clarifying the scope of efforts to increase nursing informatics competencies is critical. Small scale pilot implementations to only C-suite Nurse Leaders versus spreading the NICA-NL tool to all Nurse Leaders that make bedside nurse staffing and care process decisions will have different measures of success. Implementation of NICA-NL for C-suite Nurse Leaders may involve one-on-one sessions and individual guidance. NICAL-NL consists of six sections: 1) Strategic Implementation Management, 2) Advanced Information Management and Education, 3) Executive Planning, 4) Ethical and Legal Concepts, 5) Information Systems Concepts, 6) Requirements and System Selection. If identified as a low competency, the C-suite Nurse Leaders could be provided with one-on-one sessions and guided resources specific to these concepts. Evaluating effectiveness with C-suite Nurse Leaders could include individual follow-up via qualitative interviews to uncover perceptions of increased competencies related to Executive Planning, remaining gaps in knowledge, and demonstration of application of this new informatics knowledge into his or her responsibilities related to Executive Planning.

Implementation of NICA-NL across a broad swath of managers and directors of clinical units in a hospital could be achieved through recorded and live webcasts introducing the tool and how to access it and associated resources. Deployment using electronic survey software would allow for aggregated, de-identified data analysis to trend areas of low competency across the organization. Trending low self-assessed competencies areas could serve as high priority areas to identify and provide all Nurse Leaders within the organization links to existing educational resources or to design and provide nursing educational sessions and webinars. Process oriented metrics could be evaluated and aligned with the targeted areas for nursing informatics competencies. For example, one section in the NICA-NL tool is “Strategic Implementation Management”. Identifying this as an area of need prior to a broad Electronic Health Record (EHR) system implementation or upgrade would provide data that additional training is needed in advance of the implementation. A re-assessment of the same Nurse Managers and Directors using NICA-NL post implementation of the EHR system combined with process metrics of system implementation success (e.g., decreased portion of help desk tickets related to lack of user knowledge) could provide important data on the effectiveness of training and resources on readiness of the end-user.

Measuring actual adoption level (how many people used the tool) is critical to understand what level of impacts could be expected and potential for further uptake and spread without additional resources. Technology typically follows an adoption curve consisting of: 1) use by a few Innovators, 2) use by a small minority of Early Adopters, 3) use by an Early Majority, 4) use by a Late Majority, and finally 5) use by Laggards,

in that order.[3] Identifying characteristics of early adopters of NICA-NL may help identify motivated champions of Nursing Informatics at an organization.

3.2.2. Realizing value for an organization

A self-assessment tool is attractive to an organization precisely because it is of relative low-intensity, scalable, and sustainable. These qualities do not infer that there are no associated costs or overhead. Tracking costs, including individual's time and efforts, are important to be able to demonstrate that incurred costs, however small, are worth a sustained and budgeted investment for nursing. Resources may include use of electronic survey software and secure server access, time for nurse educators and informatics specialists to collate and/or develop resources or curricula to meet identified competency needs, and time for Nurse Leaders to complete the NICA-NL tool and use resources provided for professional development.

Incorporating the NICA-NL into orientation for new Nurse Leaders and/or yearly trainings for current Nurse Leaders at an organization could provide a sustainable path to improve competencies overtime. A culture change that recognizes the value of nursing informatics competencies as part of minimum competencies for the Nurse Leaders may be required at some organizations. Systematic implementation of the NICA-NL based on the RE-AIM framework provides steps and evaluation techniques that can be leveraged to encourage and evaluate adoption and demonstrate the value of increasing Nurse Leaders' informatics competencies for an organization.

3.2.3. Potential for impact internationally

Validated assessment tools are needed to identify gaps in knowledge and guide resource development to meet those gaps. Nursing management and practice are evolving worldwide, as described throughout this book. Our research team is currently expanding NICA for use by registered nurses (NICA-RN). Self-assessment tools can be used by the individual and with support by their organizations. The ability to evaluate trends in Nurse Leaders' informatics competency levels in the aggregate will enable the nursing profession to track improvements in knowledge and rapidly pivot resources to identified needs. With standardized validated tools these efforts can be realized at the local, regional, national and international level.

4. Conclusion

The NICA-NL is a validated self-assessment nursing informatics competency scale for Nurse Leaders. We described approaches to implementing NICA-NL at a healthcare organization using the RE-AIM framework as a path to evaluate and demonstrate value. Systematic measurement of competency levels is critical for the advancement of nursing informatics throughout the nursing profession.

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