NURSING INFORMATICS: THE ROOT FOR DEVELOPING HEALTHCARE SYSTEMS: AN OVERVIEW

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Nursing informatics is an emerging subject today and applicable in almost all the areas of healthcare settings; apart from the core Nursing sector. Nursing informatics is emerging as a domain internationally by many universities. The universities especially in United States are offering programs and research in the field Nursing informatics. Nurses, consumers, patients, and internal and external manpower may get benefits of Nursing informatics. It is a wide and broad domain today and more than a practicing field. Nursing informatics is combines with the Nursing gradients along with the Information Science gradients. Though in other sense it is a nursing science, information science and computer science integrated field. The development of *society and organization* mainly develops healthy medical systems and here solid application of Nursing informatics played a lead role. This paper deals with several aspects of nursing informatics including its characteristics, features, function and role for the future researcher.

KEYWORDS: Nursing informatics, Health Informatics, Development, Information Technology, Computing, Health Sciences, IT Management, Healthcare, Service Science

OBJECTIVES

This is a conceptual work related to the Informatics and its sub fields related to the Biological Sciences. The main and core agenda of this paper is includes but not limited to the following:
•   To know basic about the Informatics and its domains and dimensions with characteristics and features.
•   To draw the Nursing Informatics as a domain of interdisciplinary Health Science and Information Sciences.
•   To learn about the related areas of Nursing Informatics in brief.
•   To dig out the main features and function of the Nursing Informatics in present interdisciplinary science context.
•   To learn about some of the international universities where Nursing Informatics has been offered.
•   To learn the strategies, remedies of the solid and healthy Nursing Informatics design, development, evaluation and recycling etc.

METHODOLOGY

This is a conceptual paper and deals the role and features of a Nursing Informatics. Several secondary sources have used to know more about the Nursing informatics and this profession. Hence several universities and institutes; their websites has been handled to learn about the program offering. Possible organizations and associations and their websites utilized to learn more about the field. The concerned companies who deals Nursing informatics also been analyzed and reviewed.

INTRODUCTION

Nursing informatics (NI) is a combine subject of nursing science including information management for the activities

such as identifying, defining, managing, and communicating contents which include data, information, knowledge etc for better nursing practice. Nurses of several categories and importantly the consumers, patients, inter-professional professionals get healthy benefits from the Nursing informatics. Some other stakeholders also get benefits from the decision-making systems and settings to achieve desired outcomes powered by the Nursing informatics (ASU Official Web, 2016 & DeSouza, S. I., 2014). The application and utilization of information structures, information processes, and information technology etc have played a great role for the development of a Nursing informatics practice. The solid nursing practice may improve the whole healthy medical systems thus nursing informatics appreciated worldwide.   The model regulation and standard of the Nurses provided by the American Nurses Association provided in Fig: 1 [4].
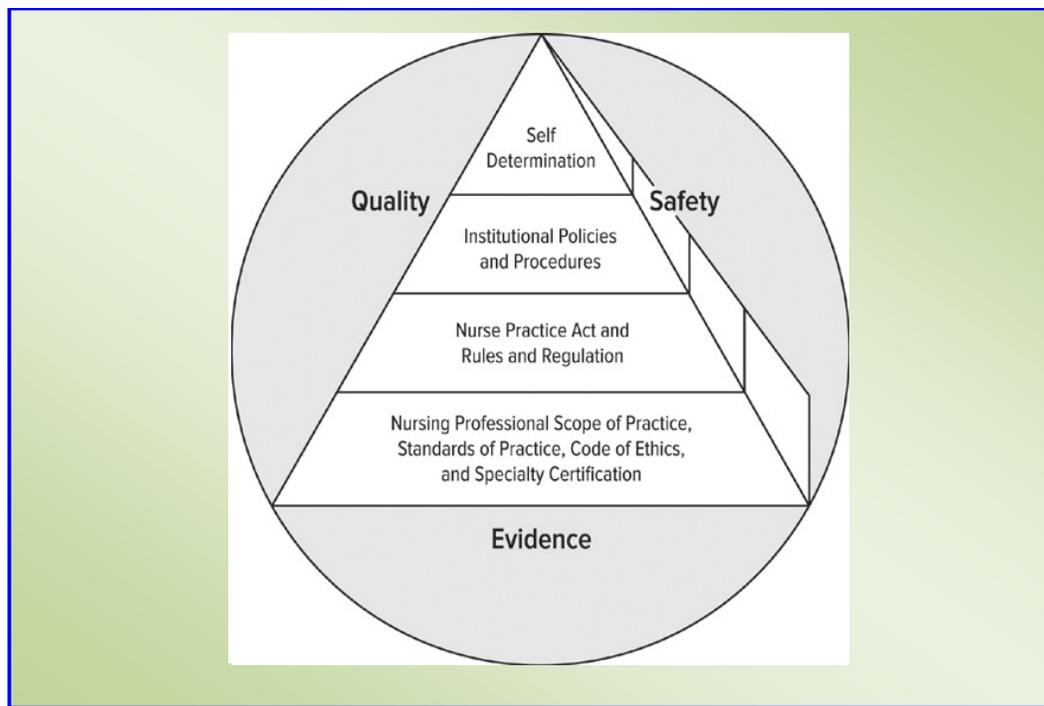

Fig: 1- The model regulation and standard of the Nurses

DEFINITIONS

- Nursing informatics (NI) is the specialty that integrates nursing science with multiple information management and analytical sciences to identify, define, manage, and communicate data, information, knowledge, and wisdom in nursing practice (Cheryl Parker, 2015),.
- NI supports nurses, consumers, patients, the interprofessional healthcare team, and other stakeholders in their decision-making in all roles and settings to achieve desired outcomes. This support is accomplished through the use of information structures, information processes, and information technology (Official Site, HIMSS, 2016).
- Nursing Informatics is the "science and practice (that) integrates nursing, its information and knowledge, with management of information and communication technologies to promote the health of people, families, and communities worldwide." (IMIA Special Interest Group on Nursing Informatics 2009). The application of nursing informatics knowledge is empowering for all healthcare practitioners in achieving patient centered care (American Medical Informatics Association, 2016 Official Site).

CHARACTERISTICS OF NURSING INFORMATICS

The new connections of the Information Technology and Systems and new solutions have been changed nursing forever (Bertelsen, L. B. P. et.al. 2015 & Nursing Now, 2001) Nursing informatics is ultimately improve patient outcomes with lower costs, it also create new tools and technologies for patient care over the Internet and similar means (Official Site, University of Pittsburg, 2016).
   The combination of cognitive science, computer science, information technology, information science, and nursing science, management science created Nursing informatics. The development, analysis, as well as evaluation and analysis of the information systems amplified by technologies which has been support, enhance and manage patient care more sophisticated manner.
In practice, the Nursing informatics professionals may observe as well as apply, analyze, and practice processes   in

nursing segment. Moreover Nursing informatics also helps in enhancement of the skills required to nursing informatics. The Nursing Informatics mainly needed for the development of leadership in nursing and similar profession, mainly (Official Site University of Pittsburg, 2016).

APPLICATIONS OF THE NURSING INFORMATICS

Nursing informatics is a novel profession and deals with several aspects and most importantly the health. Here the Table 1 depicted the Nursing informatics applications in brief.

Table1: Applications of the Nursing informatics in Brief in Emerging Context.

In Clinical Systems	In Health Administration	In Research & Development	In Education
+Recording of the Patient data in Different Format. +Recording of the Workload and interventions + Managing Health IT Products	+Critically Analysis of the MIS report generated after a specific term +Review of Outcome indication systems based on DSS and BI systems	+Evaluation and taken measures on Health Systems Promotion +Design and Development of The newer tools and strategies for better Nursing Informatics Practice	+ Gaining knowledge in Informal or Formal mode of learning + Providing the Nursing Informatics Training to the Juniors and get involved in seminar and conferences

NURSING INFORMATICS AND KEY ROLES

Nursing informatics professionals are responsible for the progress and development of the communication and information technologies in the nursing domain (Cummings, E., Borycki, E. M., & Madsen, I., 2015 & *American Medical Informatics Association, 2016 Official Site)* It also helps the educators, researchers, chief nursing officers *(also chief information officers)*, software engineers, implementation consultants, System administrator, policy developers, and business developer for the advancement of the healthcare and medical systems. Core areas and working zone are include but not limited to the

- Nursing informatics professional are mainly dedicated in the Concept representation along with standards for the support of evidence-based practice including research, and mostly education (UIC, Official Site, 2016 & Accessed Official Site University of Utah, 2016).
- Data and communication standards in the field of health and nursing to build a healthy and sophisticated data infrastructure.
- Research methodologies and systems for the dissemination of a new knowledge into perform of the nursing settings.
- Information presentation along with retrieval approaches will be better with Nursing informatics for more safe patient centered care and system.
- Information technologies and computing to address the inter-professional work flow and requirements transversely every care venues.
- Vision and also management for design, development, and accomplishment of computing and information technology
- Definition of healthcare policy to advance the public and community health system are the core priorities of the Nursing informatics practice.

Nursing science, information science and computer science are the core of Nursing informatics though some other gradients are management science, cognitive science have also played a lead role for development of the domain. Nurses are basically engages in informatics skill and knowledge development to become nurse specialist (Official Site of University of Denver, 2016 & University of Maryland, 2016). An informatics nurse is basically eligible for the identification, collection, processing and managing data and information for the nursing support and practice. It also ensures healthy administration, education, research and the expansion of nursing knowledge. Nursing informatics professionals have to promote their awareness and understanding depending upon situation in informal and formal mode of learning. Nursing informatics professionals normally engaged depending upon the set and structured norms and guidelines.

KEY MATTERS IN NURSING INFORMATICS

Many standards as well as obligations of the Nursing Informatics Professionals are there including:

- Nursing informatics professionals basically collect data regarding the health and nursing area with comprehensive evidence (Official Sites of University of Pittsburg, 2016 & University of Maryland, 2016.
- Identification of the issues, challenges and problems on nursing and healthcare are the core task of the Nursing informatics. Here Nursing informatics professionals normally engaged in problems, needs and crucial matter solutions.
- Design, develop and implementation of the expected outcomes of the identified problem/s are also important task of Nursing informatics professionals.
- Planning of the Nursing Informatics including its strategies, alternatives, healthy recommendations are most valuable and important (Paul, P.K., et.al. 2013 & Sahu, M. 2014).
- Identification and implementation of the strategy of Nursing, Medical Information Systems in healthy condition (Paul, P.K., et.al. 2013).
- Proving the health and medical solutions and strategies including proving the training and education to the new comers.

NURSING INFORMATICS AND ACADEMIC PROGRAMS

Nursing informatics is widely available in the US based universities. Many organizations recruiting Nursing informatics professionals with several level of study, many of the absorbed based on their qualification and degrees etc.
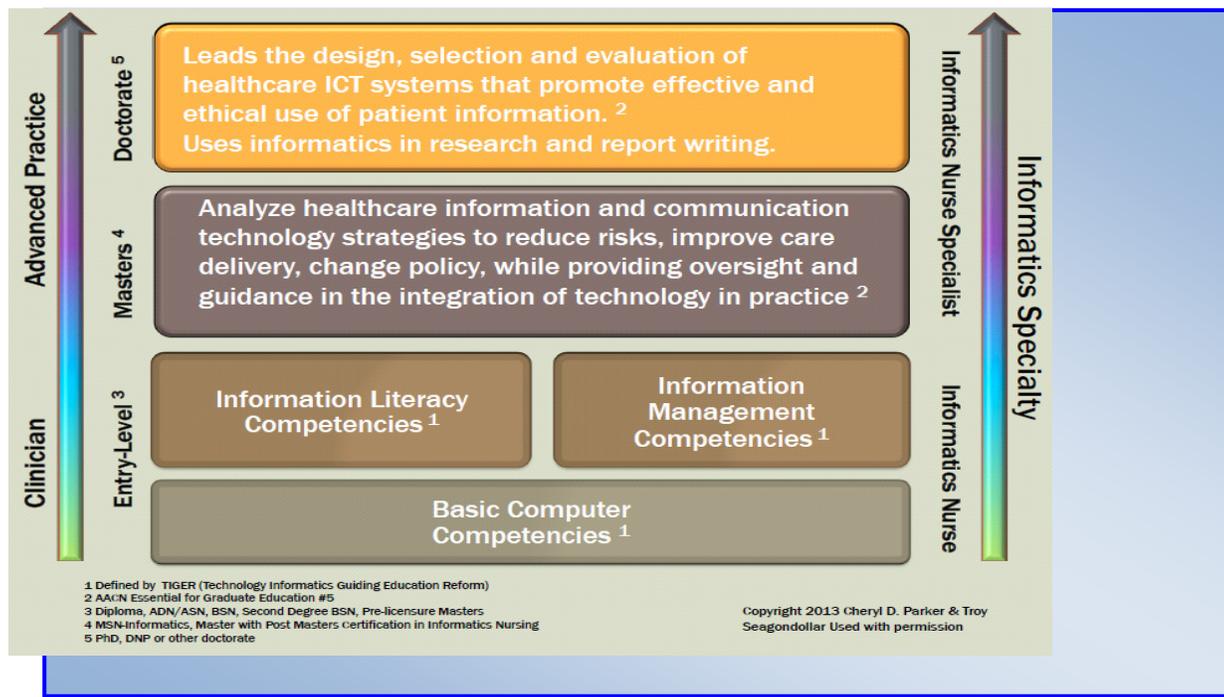

Fig 2: The Nursing Informatics qualification and proposed roles [4].

Nursing Informatics is available around the world as an advance program of the study due to the following role of the Nursing Informatics worldwide.

- Providing consultation among the medical, health professionals together with the physician and other professionals.
- Nursing Informatics deals several aspects ethically and based on the need of the organization (HIMSS Official Site, 2016 & Goossen, W. T., 1996).
- Nursing informatics professionals have to know good skills and proper communication skills depending upon need.
- Nursing informatics professionals may also deals research and evidence based work based on need (Paul, P.K., et.al. 2016 & Sahu, M., 2016).

- Effectiveness, usefulness as well as qualities are important and valuable facets for the current and emerging Nursing Professionals with specialization in the Nursing informatics.
- Leadership and management Power including the required skills are also valuable for healthy and effective Nursing Informatics practice.
- Collaboration with the other peers such as doctors and allied health professionals are important for Nursing informatics practice. Moreover relationship with the patient and parties are also important and valuable (Yucel, G., 2012).
- Effective management of resources and wealth are most important in contemporary Nursing Informatics Professional.
- Safe and Healthy Environment is become a good role of the Nursing Informatics Professionals (Paul, P.K., et.al. 2015).

Most of the Nursing Informatics programs are available with the specialization of the Master of Science- Nursing program as a Major. However, very few have been offered program on Nursing Informatics with BSc/MSc degree. Some of the Universities which offer the Nursing Informatics or allied programs are depicted in Table: 2.

Table2: The popular Nursing Informatics Programs with universities.

University	Programs
University of Colorado	MS-Nursing (Nursing Informatics)
University of Pittsburg, United States	MS-Nursing (Nursing Informatics)
Duke University, School of Nursing	MS-Nursing (Health Informatics)
University of Utah	MS-Nursing (Health Informatics)
University of Maryland, School of Nursing, Baltimore	MS-Nursing (Health Informatics)
American Sentinel University	MS-Nursing (Health Informatics)

FINDINGS

- Nursing Informatics is a practicing field *and knowledge domain* as well with several university domains.
- Nursing Informatics as a field mainly available in the universities of the United States.
- Few programs have seen on MS- Nursing Informatics. Though PhD- Nursing Informatics Major is noticed.
- Nursing Informatics program is adopting many current nurses who are interest to change their concentration on nursing.
- DPN i.e. Doctor of Practicing Nurse with focus on Nursing Informatics also available in many US universities.

SUGGESTION

- There is a handsome need of Nursing Informatics practices in the healthcare settings and medical units globally.
- Nursing Informatics programs need to start in Bachelor and Masters Level in the *BSc/MSc-IT/Informatics/Information Science/Information Systems* program as a *Major* or *Specialization*.
- There is a limitation on Nursing Informatics program in the United Kingdom, UAE and other Asian Countries. So in such countries the Nursing Informatics or related programs need to start.
- Nursing Informatics program may be started as a Focus on MS-Health Informatics in the running universities.

CONCLUSION

Health is most vital and important name in our life. Without good health everything becomes valueless. Universities worldwide producing many skilled manpower in the field of Nursing Informatics. In the developing country too, Nursing Informatics practice and manpower development need to consider as most vital and voluble for sophisticated health systems development.

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