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# Informatics Competencies in Connected Health: Annotated Bibliography

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**Abstract.** In this book it is of course impossible to be complete on all competencies publications, or all relevant subjects. For that reason the Post Conference Team decided to have some pages of the book reserved for annotations. An annotation is seen as a short reference to another topic or publication, not included in this book, and a brief motivation from one of us, why this might be of interest to the readers.

Keywords. Informatics, Competencies, Technology, Education, eHealth, Connected Health, Nursing, Annotated Bibliography

# 1. Introduction

During the discussions in the NI2016 post-conference the group came up with several suggestions for additional subjects to be included. However, once a specific theme is chosen, and all authors have contributed their work, it is has become too difficult to change it. And, in which direction would it have to be changed? There are so many options available. It is simply impossible to be 100% complete on the current health informatics topics, and given the targets for the post-conference to focus on connected health, some topics are simply out of scope.

In addition, due to the focus on the practicing nurse, and on nurse teachers and leadership who would facilitate the practicing nurses, this book could not include much for the nurse informaticians. In the past nursing informatics education was identified on four levels: level 1: the practicing nurse, level 2: advanced professional roles such as teaching, managing, advanced nursing practice, research, level 3: nurse informatics specialist and level 4: the PhD prepared nurse informatics researcher (1). In the context of this typology only levels 1 and 2 have been addressed, so not all competencies publications could be included.

For these reasons the Post Conference Team decided to have some pages of the book reserved for annotations. An annotation is seen as a short reference to another topic or publication, not included in this book, and a brief motivation from one of us, why this might be of interest to the readers. This way, it is possible to point to interesting new developments and to competencies that could not be included. Each of the participants was offered the opportunity to include a key reference.

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# 2. Annotated Bibliography, with references

2.1. Automation: Will it change nurse, nursing, or both?

#### Suggested by: Anne Moen, RN, PhD, FACMI:

*Bibliographic data of the annotated reference:* Peplau HE. Automation: Will it change nurse, nursing, or both ? Nursing Forum. 1962;34(3):31-6.

Summary of the content: This paper is among the first publications on automation, computers and medical technology for nursing. The paper points out the need for proactive leadership and future-oriented education to prepare, participate and embrace opportunities following "automation". Nurses should differentiate between types of technologies, acquire competencies to contribute developing and deploying solutions and take advantage of opportunities for transformation practices in line with the mission of nursing.

*Reason to recommend this reference:* A seminal paper, published 1962, calling for nursing leadership and nursing participation, raising a call to explore opportunities, prepare, ask questions and participate to prepare in shaping the informatics solutions that will support and not change the <u>mission</u> of nursing. We find inspiration and encouragement in this seminal paper and it gives a longer-term perspective to the nursing informatics community.

#### 2.2. Nurse - patient relationship

Suggested by: Michelle Honey RN, PhD and Paula Procter RN, PhD:

*Bibliographic data of the annotated reference:* Nelson R, and Carter-Templeton HD. The Nursing Informatician's Role in Mediating Technology Related Health Literacies. Sermeus W et al (Eds) Nursing Informatics 2016: eHealth for All: entry Level Collaboration - From Project to Realization. IOS Press. 2016 pp 237-241. ISBN 978-1-61499-658-3 (online).

Summary of the content: The paper considers the link between informatics competencies that nurses develop within their programs and the digital engagement with patients.

*Reason to recommend this reference:* Some might argue that the link suggested in the paper between the nurse and patient through digital technologies is a little tenuous, it does however raise some key points around the role of nurses as we progress further into the 21<sup>st</sup> Century whilst at the same time remaining true to the core values of nurses and those in their care.

# 2.3. An Introduction to Nursing Informatics

Suggested by: Susan K Newbold, PhD RN-BC FAAN FHIMSS

*Bibliographic data of the annotated reference:* Houston, S., Dieckhaus, T., Kirchner, B., & Rookwood, R. (2015). An Introduction to Nursing Informatics: Evolution & Innovation. Chicago: HIMSS Media.

*Summary of the content:* This nursing informatics book was written as a primer for the nurse interested in informatics and considering entering the field. Informatics is defined and the evolution of nursing informatics is highlighted. The reader is invited to

consider a career path in nursing informatics and is treated to a day in the life perspective of an educator, student, researcher, clinician, consultant, vendor, and government employee. The appendix includes four case studies and questions – for example – Career Options for Nurses working with Informatics.

*Reason to recommend* this *reference:* A nurse who is considering nursing informatics as a profession can benefit from reading this primer on nursing informatics. The book could be a great investment in career planning.

#### 2.4. Evidence-Based Health Informatics

#### Suggested by: William Goossen PhD:

*Bibliographic data of the annotated reference:* Ammenwerth E, Rigby M (Editors). Evidence-Based Health Informatics. Studies in Health Technology and Informatics, 2016, Volume 222. ISBN 978-1-61499-634-7 (print) | 978-1-61499-635-4 (online) Open Access.

*Summary of the content:* This book addresses the need for better understanding of the importance of robust evidence to support health IT and to optimize investment in it. The authors give insight into health IT evidence and evaluation as its primary source. They further promote health informatics as an underpinning science to demonstrate ethical rigor and proof of benefits in a similar manner that it is applied to other health technologies as medical devices and medicines. The three parts of the book cover: 1) the context and importance of evidence-based health informatics; 2) methodological considerations of evaluation of Healthcare IT; and 3) ensuring the relevance and the application of evidence in practice.

*Reason to recommend this reference:* There is an increasing understanding that health informatics technology (HIT) are not only beneficial to patients, providers or health care. Using scientifically sound methodologies to research the effects of HIT on patient care, professional work and healthcare is important so we learn and know what works and what does not. This book by Ammenwerth and Rigby is an important update to the existing knowledge in the field on the evaluation of health informatics. During the final weeks before the preparation for the NI 2016 Post Conference, the EFMI list for health informatics evaluation send out a message about its publication, but too late to be included as a subject, and also out of scope for our primary target audience.

# 2.5. Evidence based nursing informatics competencies

### Suggested by: Michelle Honey RN, PhD et al:

*Bibliographic data of the annotated reference:* Desjardins KS, Cook SS, Jenkins M, Bakken S. Effect of an informatics for evidence-based practice curriculum on nursing informatics competencies. International Journal of Medical Informatics. 2005;74(11-12):1012-20.

Summary of the content: This article reports describes the effect of an evolving informatics for evidence-based practice curriculum on nursing informatics competencies in three student cohorts using a repeated-measures, non-equivalent comparison group design to determine differences in self-rated informatics competencies pre- and post- informatics evidence-based practice education. While no significant differences between cohorts were found, the importance of assessing informatics competency attainment so that curricula can be refined is emphasised.

*Reason to recommend this reference:* While this is a somewhat dated US based study from Columbia University School of Nursing, it is one of the few examples located that explores informatics within a curriculum. Despite none of the three nursing student cohorts studied achieving competence despite curricular revisions, this article demonstrates that nursing informatics competencies can be assessed against creating informatics competent graduates.

# 2.6. Practicing nurse competencies

# Suggested by: Lynn Nagle PhD RN:

*Bibliographic data of the annotated reference:* Canadian Association of Schools of Nursing (CASN). Nursing Informatics Entry-to-Practice Competencies for Registered Nurses (2012). Author: Ottawa, ON Canada. Available at: http://www.casn.ca/education/digital-healthnursing-informatics-casn-infoway-nurses-training-project/

*Summary of the content:* This document provides a background and overview of the informatics entry-to-practice competencies developed for Canadian nurses. The competencies have been derived from previously developed competency frameworks. The 3 competency areas include performance indicators in the areas of: 1) information and communication technology use, 2) information and knowledge management, and 3) professional and regulatory accountability.

*Reason to recommend this reference:* This work may inform the nursing informatics competency development efforts of other countries. This document and other "how to" teaching materials are available at no cost from the above website (e.g., "Nursing Informatics Teaching Toolkit" and "Consumer Health Solutions Resource" for nurse educators).

# 2.7. TIGER Competency Synthesis Project

Suggested by: Joyce Sensmeier MS, RN-BC, CPHIMS, FHIMSS, FAAN:

*Bibliographic data of the annotated reference:* Hübner, U., Shaw, T., Thye, J., Egbert, N., Marin, H., Ball, M.J. Towards an International Framework for Recommendations of Core Competencies in Nursing and Inter-Professional Informatics: The TIGER Competency Synthesis Project. In Hoerbst, A. et al. (Eds.). Exploring Complexity in Health: An Interdisciplinary Systems Approach, 655-659. DOI 10.3233/978-1-61499-678-1-655. 2016 European Federation for Medical Informatics and IOS Press.

*Summary of the content:* Informatics competencies of the healthcare workforce must meet the requirements of the inter-professional process and outcome oriented provision of care. In order to help nursing education transform accordingly, the TIGER Initiative deployed an international survey, with participation from 21 countries, to evaluate and prioritize a broad list of core competencies for nurses in five domains: 1) nursing management, 2) information technology (IT) management in nursing, 3) interprofessional coordination of care, 4) quality management, and 5) clinical nursing. Informatics core competencies were found highly important for all domains. In addition, this project compiled eight national cases studies from Austria, Finland, Germany, Ireland, New Zealand, the Philippines, Portugal, and Switzerland that reflected the country-specific perspective. These findings will lead us to an international framework of informatics recommendations

*Reason to recommend this reference:* The TIGER Competency Synthesis Project continues to evolve with additional findings, publications and insights. This article was published subsequent to the NI 2016 Post Conference and is an important update to increase our understanding of the implications of the international competency synthesis.

#### 2.8. Learning in nursing

#### Suggested by: Michelle Honey RN, PhD and Paula Procter RN, PhD:

*Bibliographic data of the annotated reference:* Downes S. Connectivism and connective knowledge: Essays on meaning and learning networks [Internet]2012 [Available from: <u>http://www.downes.ca/files/books/Connective\_Knowledge-19May2012.pdf</u>.

*Summary of the content:* A self-published book that considers three major domains, knowledge, learning and community, each representing an aspect of network theory. He includes a critique of Siemens work, and also brings in use of the cloud and Massive Open Online Courses (MOOC) in education.

*Reason to recommend this reference:* For those who are interested in reading more about Connectivism, this over 600 page self-published book provides views that will encourage consideration about what connectivism is and how it can impact education and learning.

#### 2.9. Nursing informatics curriculum

Suggested by: Michelle HONEY RN, PhD and Paula PROCTER RN, PhD:

*Bibliographic data of the annotated reference:* Cummings E, Shin EH, Mather C and Hovenga E. Embedding Nursing Informatics Education into an Australian Undergraduate Nursing Degree. Sermeus W et al (Eds) Nursing Informatics 2016: eHealth for All: entry Level Collaboration - From Project to Realization. IOS Press. 2016 pp 329-333. ISBN 978-1-61499-658-3 (online).

Summary of the content: Following the mandate in Australia to include informatics in nursing curricula, this paper explains how one University has tried to meet this challenge even with a lack of nationally agreed competencies.

*Reason to recommend this reference:* The paper raises a number of issues which remain unaddressed in a number of countries where there is a will to include informatics in nursing curricula particularly at first level education. It explores in a pragmatic way the decision steps that were followed in order to advance the knowledge for nursing students.

# 2.10. Online resources for nursing informatics

#### Suggested by: Lisiane Pruinelli, PhD, MS, RN:

Bibliographic data of the annotated reference: Clancy, T.R. Integrating AACN Essentials, QSEN KSA's and TIGER Competencies for Nursing Informatics [Internet]. School of Nursing, University of Minnesota, US; 2016; [cited 2016 Sep 26]. Available from: <u>https://www.nursing.umn.edu/outreach/nursing-informatics-educationand-resources/nursing-educators</u>.

Summary of the content: This repository contains resources from a collaborative effort of AACN, the University of Minnesota School of Nursing, and the University of

Maryland School of Nursing. Materials are freely available, featuring numerous sample assignments, links to informatics standards and professional Web sites, and instructional videos on a variety of subjects such as EHRs, standardized nursing languages, workflow, consumer informatics, telehealth, and other key emerging areas.

*Reason to recommend this reference:* This web page contains resources for students and educators in nursing informatics, aligned with national and international recommendations.

## 2.11. Assessment of nursing informatics competencies

#### Suggested by: Laura-Maria Peltonen, RN, MNSc:

*Bibliographic data of the annotated reference*: Choi J, De Martinis JE. Nursing informatics competencies: assessment of undergraduate and graduate nursing students. Journal of Clinical Nursing. 2013 Jul;22(13-14):1970-6. doi: 10.1111/jocn.12188.

*Summary of the content:* This article discusses informatics competencies of students in undergraduate and graduate nursing programs based on findings from a survey where data were collected regarding students' self-evaluation of informatics competencies from one state university in the USA. The authors discuss different aspects to be considered in informatics curriculum development of undergraduate and graduate nursing programs.

*Reason to recommend this reference:* The discussed aspects may be of use to nurse educators in determining specific areas to consider when developing nursing educational programs to ensure sufficient competence in nursing practice.

# 2.12. Structured Nursing Records

#### Suggested by: Ulla-Mari Kinnunen, PhD, RN:

*Bibliographic data of the annotated reference:* Saranto K, Kinnunen UM, Kivekäs E, Lappalainen AM, Liljamo P, Rajalahti E, et al. Impacts of structuring nursing records: a systematic review. Scandinavian Journal of Caring Sciences Nov (2013), 18: 1-19.

Summary of the content: The aim of this systematic review is to describe the impacts of different data structuring methods used in nursing records or care plans. It examines what kinds of structuring methods have been evaluated and the effects of data structures on healthcare input, processes and outcomes in previous studies. Various codes, classifications, terminologies or structured forms were most often used in the studies. Beside these or independently the nursing process model was used in 64 % of the analyzed articles. The unexpected impacts for healthcare inputs were a lack of resources, e.g. managerial support and education, and for processes negative attitudes because of lack of support. Vice versa the positive impacts to outcomes were secondary impacts, e.g. research, management, education.

*Reason to recommend this reference:* Review provides useful information about the knowledge of the needs of nursing practice and management as well as nursing informatics. Acquisition and dissemination of knowledge of the use, effects and benefits of standardized nursing languages is very much needed when its implementation is under planning or adoption already in process, and curricula for nursing schools are under development and update.

# 2.13. Personal Health Records

# Suggested by: Kaija Saranto PhD, RN, FACMI, FAAN:

Bibliographic date of the annotated reference: Saranto K, Brennan Flatney P, Casey A (eds): <u>Personal Health Information Management Tools and Strategies for</u> <u>Citizens' Engagement</u> University of Kuopio, Department of Health Policy and Management, Kuopio, 214 pages, 2009.

Summary of the content: The publication is a summary of personal health information management tools and strategies for citizens engagement produced in the NI2009 post-conference congress. The publication gives several perspectives to personal health information management e.g. technology, usability, governance, clinical practice, confidentiality and safety. Reflecting our topic in 2016 a group of expert in 2009 also focused on competencies under the title: *The Personal Health Information Management Systems & Education: Preparing Nurses to practice in a Wired World.* It also provides descriptions of the situation in 16 countries.

Reason to recommend this reference: This publication reflects our post-conference theme Forecasting Informatics Competencies for Nurses in the Future of Connected Health. The publication from NI2009 describes the situation in personal health information management almost ten years ago. Thus it gives us perspectives how we have made progress during the years. The publication focuses on the development of tools, their use and implementations to practice. At that time we were probably more concerned about citizens' access to their data than the variety of tools providing the access nowadays. We also recognized the need for governance which still is sometimes our weakest link in implementations. However, most importantly without education there will be no progress. Thus we need to define and set the goals, contents and methods how to enhance nurses' informatics competencies needed in the future.

# 2.14. Competencies for Nursing Telehealth

#### Suggested by: Ybranda Koster MScN:

*Bibliographic data of the annotated reference:* C.T.M. van Houwelingen, A.H. Moerman, R.G.A. Ettema, H.S.M. Kort, O. ten Cate, Competencies required for nursing telehealth activities: A delphi-study, Nurse Education Today 39 (2016) 50-62.

*Summary of the content:* This study presents fourteen nursing telehealth activities to support patients and 32 'new' telehealth-specific competencies required for the provision of telehealth.

*Reason to recommend this reference:* The required telehealth competencies presented in this study can be used by nursing schools that are considering including or expanding telehealth education in their curriculum and may strengthen the development of telehealth education.

# 2.15. Patient Safety and Nursing Informatics

#### Suggested by: Elizabeth Borycki RN PhD:

*Bibliographic data of the annotated reference:* Borycki, E., Keay, E. Methods to assess the safety of health information systems. Healthcare Quarterly, 2010; 13: 47-52.

Summary of the content: There is growing evidence that health information systems, when not designed, developed, implemented and maintained properly, can cause health professionals to make errors (i.e. technology-induced errors). The article

reports on the results of a review of the literature examining the methods that can be used to predict, prevent and evaluate the potential of health information systems to cause technology-induced errors. Such methods, if used appropriately, can reduce the likelihood of an occurrence of a technology-induced error and can improve the overall safety of health information systems.

*Reason to recommend this reference:* The reference outlines the main methods used to assess health information systems for safety and the presence of technology-induced errors. Identifying and addressing technology-induced errors will ensure the overall safety of systems over time. The article outlines the methods that should be used to identify technology-induced errors before, during and after the implementation of a health information system.

#### 2.16. Competencies in social media use in the area of health and healthcare

#### Suggested by: Patrick Weber RN, MA

*Bibliographic data of the annotated reference:* Ventola CL. Social Media and Health Care Professionals: Benefits, Risks, and Best Practices. Pharmacy and Therapeutics. 2014;39(7):491-520.

Summary of the content: Many social media tools are available for health care professionals (HCPs), including social networking platforms, blogs, microblogs, wikis, media-sharing sites, and virtual reality and gaming environments. These tools can be used to improve or enhance professional networking and education, organizational promotion, patient care, patient education, and public health programs. However, they also present potential risks to patients and HCPs regarding the distribution of poor quality information, damage to professional image, breaches of patient privacy, violation of personal–professional boundaries, and licensing or legal issues. Many health care institutions and professional organizations have issued guidelines to prevent these risks.

*Reason to recommend this reference:* This paper is a very good overview of the use of social media for healthcare professionals. It takes into account the healthcare professional person, the patient, the institution. It gives information about a number of social media tools. It goes through some legal aspects.

#### 2.17. Genomics relevance for nursing

# Suggested by: Kathleen McCormick RN, PhD:

*Bibliographic data of the annotated references:* McCormick, K.A. and K.A. Calzone, The impact of genomics on health outcomes, quality, and safety. Nurs Manage, 2016. 47(4): p. 23-6.

*Summary of the content:* This recent publication highlights the importance of integrating genetics and genomics into nursing care to improve outcomes, quality, and safety.

*Bibliographic data of the annotated references:* McCormick, K.A., Calzone, K.A., Big Data Initiatives: Genomics and Information Technology for Personalized Health, in Essentials of Nursing informatics, 6th Edition. Saba,VK &. McCormick,KA Editor. 2015, McGraw-Hill: New York. p. 707-725.

*Summary of the content:* This book chapter summarizes the initiatives ready for use throughout the continuum of care, the resources available, implications for nursing informatics, and the Blueprint for Nursing Research needed in genetics/genomics.

*Bibliographic data of the annotated references:* Relling, M.V. and W.E. Evans, Pharmacogenomics in the clinic. Nature, 2015. 526(7573): p. 343-50.

*Summary of the content:* Describes the new evidence in CPIC guidelines ready for implementation into clinical practice.

*Reason to recommend these references:* This set describes the state of the art of genomics with respect to nursing care. First serves as an introduction, second as indepth chapter. The third moves it to the multidisciplinary care guideline for practice.

# 2.18. Nursing leaders

Suggested by: Charlene Ronquillo, RN, MSN:

*Bibliographic data of the annotated* reference: Collins S. ANI emerging leaders project: Clinical informatics governance & nursing leadership. Computers Informatics Nursing. 2014 Sep 1;32(9):420-3.

*Summary of the content:* This paper provides a discussion of the integral link between nursing leadership and clinical informatics governance, informed by a survey administered to leading nursing informatics leaders in the United States. The importance of nursing informatics leaders' roles in representing and communicating the relevance and added value of innovations in health informatics is highlighted, along with the need for organization's informatics governance to support the full extent, education, and training of nursing informatics leaders.

*Reason to recommend this reference:* This paper describes a key organizational factor to consider in supporting the visibility of nursing practice in healthcare organizations' clinical informatics systems.

#### 2.19. Nurse executive competencies

#### Suggested by: Margaret Ann Kennedy RN PhD:

*Bibliographic data of the annotated reference:* American Organization of Nurse Executives (AONE), *Nurse executive competencies*. (2015) Retrieved from: http://www.aone.org/resources/nec.pdf

*Summary of the content:* This recently updated publication from the AONE specifically sets forth a comprehensive model for nursing leadership competencies. The recommended competencies encompass all aspects within broad topics of nursing leadership including communications and relationship management, knowledge of the health care environment, leadership, professionalism, and business. Within the business section, information management and technology competencies are explicitly defined.

*Reason to recommend this reference:* Nurse executives require clearly defined competency expectations regarding informatics within leadership and executive roles. Additionally, nurse executives require support and resources in order to effectively incorporate these competencies into their day to day activities.

#### 2.20. Collaborative practice

#### Suggested by: Raji Nibber BSN, RN:

Bibliographic data of the annotated reference: Christopherson TA, Troseth MR, Clingerman EM. Informatics-enabled interprofessional education and collaborative

practice: A framework-driven approach. Journal of Interprofessional Education & Practice. 2015 Mar 31;1(1):10-5.

*Summary of the content:* This article summarizes the work of more than 346 rural, community and university settings in the United States towards developing and implementing a framework-driven approach (as opposed to project-driven) to address the gap between education and practice in delivering safe, efficient and quality care. Six models were created as a part of the framework along with processes, tools, and infrastructures to support the use of health information technology and promote interprofessional education and collaborative practice.

*Reason to recommend this reference:* This framework can be used by organizations to improve and achieve sustainable outcomes. Nurse leaders and educators specifically can address and bridge the gap between education and practice to improve interprofessional integration and collaboration of informatics across health professions.

# 2.21. Health Informatics: An Interprofessional Approach

# Suggested by: Bickford, Carol J. PhD, RN-BC, CPHIMS, FHIMSS, FAAN:

*Bibliographic data of the annotated reference:* Nelson R, Staggers N. Health Informatics: An Interprofessional Approach. St. Louis, MO: Elsevier Mosby; 2014.

*Summary of the content:* This textbook provides an interprofessional perspective and comprehensive presentation of health informatics content. Thirty-one chapters are categorized into nine units: Background and Foundational Information; Information Systems in Healthcare Delivery; Participatory Healthcare Informatics and Healthcare; Project Management: Tools and Procedures; Quality, Usability, and Standards in Informatics; Governance and Organizational Structures for Informatics; Education and Informatics; International Informatics Efforts; The Present and Future. The detailed robust content provides extensive evidence of the diversity and complexity of contemporary health informatics practice. Additional learning materials and supplemental faculty resources augment and enhance this textbook's value.

*Reason to recommend this reference:* Industry experts beyond the nursing informatics community provided key insights about issues and trends within their specialty areas. Frameworks and theories are referenced to guide the reader's understanding of health informatics.

# 2.22. Improving Health Care through Informatics

Suggested by: Daragh Rodger RGN, RNP, RANP, MSc & PhD student:

*Bibliographic data of the annotated reference:* Botin L, Bertelsen P, Nohr C. Challenges in Improving Health Care by Use of Health Informatics Technology. In: Botin L, Bertelsen P, Nohr C. 215 Techno-Anthropology in Health Informatics Methodologies for Improving Human Technology Relations. IOS Press: Netherlands, 2015:3 – 11.

*Summary of the content:* This chapter introduces Techno-Anthropology as the study of the relationship between humans and technology and how they interact. Within an eHealth and health informatics agenda, this topic is emerging as a facilitator to the provision of quality holistic healthcare through interdisciplinary engagement. It outlines the need for and identifies support strategies to meet the challenges faced by health care providers, patients and their relatives to be competent users and developers

of health technology. The book further presents how adopting a Techno-Anthropology approach can enhance health informatics and eHealth agendas.

*Reason to recommend this reference:* The overarching aim of connected health involves the patient being central to healthcare service delivery. This chapter provides an introduction to the relevance of Techno-Anthropology on eHealth and in particular on patient-centric health informatics. It also demonstrates how Techno-Anthropology can support new ways of conceptualizing and developing systems that embrace patient-centered needs, values and perspectives for a quality orientated health care system.

## 2.23. Nursing Informatics Research Priorities

## Suggested by: Maxim Topaz PhD, RN, MA:

*Bibliographic data of the annotated reference:* Peltonen LM, Topaz M, Ronquillo C, Pruinelli L, Sarmiento RF, Badger MK, Ali S, Lewis A, Georgsson M, Jeon E, Tayaben JL, Kuo CH, Islam T, Sommer J, Jung H, Eler GJ, Alhuwail D. Nursing Informatics Research Priorities for the Future: Recommendations from an International Survey. Stud Health Technol Inform. 2016;225:222-6.

*Summary of the content:* This paper provides a discussion of the future nursing informatics research priorities, based on analysis of a study conducted by the International Medical Informatics Association- Nursing Informatics Special Interest Group (IMIA-NISIG) Student Working Group. 373 responses from 44 countries were analyzed. The identified top ten nursing informatics research trends were big data science, standardized terminologies (clinical evaluation/implementation), education and competencies, clinical decision support, mobile health, usability, patient safety, data exchange and interoperability, patient engagement, and clinical quality measures. Acknowledging these research priorities can enhance the successful future development of nursing informatics to better support clinicians and promote health.

*Reason to recommend this reference:* This paper describes ten key research areas recommended as a focus for nurse informatics researchers in the coming years.

# References

 Goossen, W., Hannah, K.J., (1991). A curriculum about nursing informatics for a nurse educator's educational programme. In: Hovenga, E.S.J., Hannah, K.J., McCormick, K.A., & Ronald, J.S., (Eds). Proceedings Nursing Informatics '91 conference. Melbourne Australia, 690-694.