REFLECTION ON DATA SCIENCE IN NURSING

Name: Miss Somrudee Arunjit

Student ID: 6410430022

1. What you have learned?

I gained new knowledge about bringing health information to benefit service recipients through machine learning and/or artificial intelligence.

Using health information to benefit clients, for example, using Twitter to learn about health problems, using social media to take action to solve health problems, such as symptoms of dementia and Alzheimer's, caregiver burnout, etc.

Using machine learning to manage data sets, such as managing numbers, text, and pictures as data then bring the data to analyze and predict outcomes.

Using Artificial Intelligence; AI to solve problems in health, such as creating models, and applications. Currently, AI is popular because technology is advanced. Therefore, we can bring technology to apply to nursing.

These help nurses learn about applying data science, technology, and nursing.

2. What did you find it is interesting?

I am interested in 2 topics include: using social media information and using nursing notes in research.

1) Using social media information to learn about the real problem of the client. Can do it because social media is one factor for people. We can find health problems by posting people's feelings and taking those problems to correct them, such as "Use of social media in different contexts of information seeking: effects of sex and problem-solving style" (Kim & Sin, 2015).

2) Previously, I perceive only the quality checks of the nursing notes. I think it is an important process but when I understand the process of analyzing nursing notes for research affects the process of nursing and the outcome of caring for patients (Urquhart et al., 2018). I feel nursing note is very important and valuable. As I am a teacher, I will teach nursing students the importance of nursing notes because these notes can be analyzed in order to plan for effective care of the patients in the future and even to predict the condition of various signs and symptoms of the patients.

3. What questions remain in your minds?

If in a hospital that still writes the nursing notes on paper by hand. Is there any way to use those nursing notes for the benefit of service patients?

From my further study, I found the thesis for a master's degree in Onanong Wongmahachai studied the analysis of nursing records using international classification for nursing practice, in the inpatient department, Sakon Nakhon hospital. This is a retrospective study of 120 randomized inpatient medical records which are handwritten medical records. The results of the study focused on guidelines for developing writing the nursing notes but handwriting the nursing notes is analyzed quality in difficulty. Therefore, suggests using the program to record the nursing notes. The analysis of nursing notes did not reach the nursing process and patient care outcomes or even predict patient signs and symptoms but using a nursing record program, use machine learning, and use artificial intelligence will be able to analyze the nursing process care planning and predict care. I hope that the future of my country can be achieved.

References

Kim, K., & Sin, S. J. (2015). *Use of social media in different contexts of information seeking: effects of sex and problem-solving style.* https://files.eric.ed.gov/fulltext/EJ1060504.pdf

Wongmahachai, O. (2013, June). *An analysis of nursing records using international classification for nursing practices, in inpatient department, Sakon Nakhon hospital* [Master's thesis, Burapha University]. http://digital_collect.lib.buu.ac.th/dcms/files/53921136.pdf

Urquhart, C., Currell, R., Grant, M. J., & Hardiker, N. R., (2018). Nursing record systems: effects on nursing practice and healthcare outcomes. *Cochrane Database of Systematic Reviews*, 5(CD002099) https://doi.org/10.1002/14651858.CD002099.pub3.

Reflection on data science in nursing

Kang Qin

1. What I have learned?

Some experts say that data science is not so technical but creative. According to the professors' lecture, I found it indeed creative, we can get a lot of information from the data which is collected from our nursing work. From daily nursing work, it generates data, it need a tool or methods to analysis the data and get the inherent laws of things, it is interesting to extract the valid information from data, and it is also a process of exploration, from the data, maybe we can find a new word. Data is drawn from different sectors, channels, and platforms, including cell phones, social media, e-commerce sites, healthcare surveys, and internet searches. The increase in the amount of data available opened the door to a new field of study based on big data—the massive data sets that contribute to the creation of better operational tools in all sectors.

2. What I found it is interesting

After learning data science, I was thinking about how to use data science in my work to better solve problems in my work, Perhaps what I have learned is that I have broadened my vision and gained another mode of thinking. I can solve problems in multiple ways, and I should not be trapped by a certain idea.

When I try to understand the ppt from the speaker, especially a lot of chart were used, I realized the importance of statistics, it reminds me of the R studio I learned before which is a statistical software, but unfortunately, I do not have a good application of this skill. Use statistical tools to analyze data to obtain information and guide practice. This should be the reason why ajarn let us learn this.

3. What questions in my mind

Data science for me first time to hear, I feel it much too techy, it may difficulty for me to learn. In fact, it really difficulty for me to understand, especially because of my work, I missed part of the course. It is really a pity. So I found some materials from the

internet, it is good for me to understand what is the data science. It is an interdisciplinary subject that requires comprehensive application of mathematics, statistics, nursing and other professional knowledge. It is very important for me to supplement the basic knowledge of statistics.

Reflection on the session on data science in nursing

Student name: Jing Sun. Student ID: 6410430013

1. *What I have learned?*

Nursing is an applied science and a key discipline in health care systems in both clinical and educational areas. In addition, the current trend is that nursing has been developing with other cross-disciplinary, such as nursing and psychology, nursing and rehabilitation, etc., which also gives us more enlightenment and thinking. In our daily work, data is everywhere, we should have eyes that are good at finding problems. In fact, many clinical nursing rounds and nursing records can be found of problems and regularity through the accumulation of time. At the same time this session also let us know the importance of electronic information-based nursing. In many general hospitals in China, doctors' progress records and nurses' nursing records have begun to use HIS (Hospital Information System). In order to improve the efficiency, many hospitals have set up clinical nursing paths. For patients with the same nursing problems and using same nursing measures, they can just click the corresponding template, and then make small and appropriate adjustments according to the patient's condition, and completed a nursing record sooner in this way. But this also reminds me of the importance of person-centered care to individual cases, otherwise buried in structured flowchart fields.

2. *What I found it is interesting*

What I found interesting in Professor Suzanne's report is that data visualization can help us discover existing problems more intuitively and provide a more convincing basis for improving the quality of clinical care. Professor Maxim's report reminded me of the research my classmates did during the master's degree on the risk factors of gastric cancer, which was also carried out in the form of retrospective medical records, but at that time, many of the medical records were handwritten by doctors with different handwritings, this creates a lot of difficulties for backtracking. Now, through the information system and means,

it actually provides more platforms and possibilities for nursing researchers. This reminds me of the nursing teaching work. Many reflections and homework of students are actually important carriers for us to discover problems. In Professor Kenrick's report, the CONCERN Predictive Model can detect and predict patients' deterioration, which I found the most interesting.

3. *What questions in my mind*

I think the natural language processing methods is very suitable for patient-report outcome-based research, such as different self-health management can lead to different patient outcomes, so as to conduct research on related health promoting behaviors. The CONCERN Model can provide a basis for clinical nurses to make decisions and identify some potential problems of patients. In nursing education area, I think maybe we can conduct research to reduce the errors of nursing students during internship by using data from clinical reflection diary. Or study the death events that nursing students encounter during their internship to provide a basis for life education in the subsequent hospice care courses. In clinical nursing area, we can conduct research on creating complication risk predict model from clinical data, such as nursing notes and so on.

REFLECTION OF THE RESEARCH ACTIVITY

Special lecture on topic "Data in Science Nursing"

Name : Amelia Ganefianty

Student ID : 6310430008

1. **What you learned?**

I learned a lot about data in nursing from attending all three lecture sessions. I am delighted and lucky to follow the lecturer. I got a lot of new learning and understanding. I now understand that the data nurses document are essential and of great value when analyzed. Nursing's participation in the big data and data science initiatives now underway is necessary to ensure that the discoveries not only be shaped by nurses' profession's unique understanding of the patient experience but also that the findings lead to knowledge that is useful to nursing.

I also learned that technology is growing and making the world of nursing easier. For example, mining Twitter to learn about social support for caregivers of those with dementia and Alzheimer's Disease. Efficient data entry by clinicians remains a significant challenge for electronic medical records. We can take advantage of the natural learning process in determining a decision in nursing. Natural Language Processing (NLP) offers an approach for capturing data from narratives and creating structured reports for further computer processing.

From these three sessions, I also concluded that Nursing needs big data, and big data needs nursing. As a profession, we have much to gain and much to contribute to a healthcare system informed by the discoveries enabled by data science. As not every nurse will be, or should be, prepared as a data scientist, but all nursing practice and research should be informed by data science. The pathway to the future is through partnerships and team science. I understand that the data that nurses collect in nursing notes and computerization is excellent for the decision-making process in nursing care for patients. Data-informed nursing practice from nurses caring for patients have a greater understanding of the patient experience through data science and can use the more comprehensive view of the person to devise creative approaches to interventions and

monitor the effectiveness of the interventions. These nurses also have a unique point of contact for assuring patient understanding of data rights and assisting in data collection.

And from now on, I will begin to introduce and socialize with nurses who work in hospitals where documenting the patient's condition is crucial. The data nurses report from the patient's condition can be used as big data that can be analyzed and later can be helpful in decision-making in nursing and predict the patient's condition. For me, who works in the ICU, data processing technology can also assist in assessing the worsening of the patient's condition. Of course, nurses can prevent worsening conditions in ICU patients, prevent complications from occurring in patients, and reduce the length of hospitalization. Of course, this condition will make the quality of nursing care in hospitals more optimal.

Currently, at the hospital where I work, the early warning system is a monitoring system with general physiological scoring used in the medical-surgical service unit before the patient experiences an emergency. This tool is simple and easy to use at the bedside, so nurses will be better prepared to evaluate changes in the patient's condition and intervene appropriately. However, no analysis was conducted of the data collected from the EWS monitoring. However, these data can be used in analyzing and assessing the patient's worsening in the future. This meeting triggered me that in the future, the analysis of big data can be developed in the hospital where I work.

2. What you found it in interesting?

I am interested in data analysis that can do from nursing notes in the ICU. Although we can do extensive data analysis in the ICU, we must pay attention to the aspects of bias as we know that patients in the ICU have unstable hemodynamics and sometimes unconscious conditions. In addition, while comparing nurses to patients, sometimes one nurse holds one or two patients. So if there is a worsening condition in the patient, the nurse sometimes does not wholly record the chronology of the worsening of the patient's condition. These things can cause bias in nursing notes. Therefore, several techniques can be used to minimize the occurrence of bias. First, we need an expert who can assess the content of the analysis results and the data collected from the nurse's records. Second, in analyzing patient data from the results of nurse records, large amounts of data are needed so that they can compare one data and another. Then, qualitative data is required to support quantitative information, which is data on the patient's condition. So,

some interventions to minimize this bias should be done if we want to analyze big data of nurses' records.

3. What questions in your mind?

I thought and asked how to start developing this data analysis in the hospital where I work. Because so far, there are so many clinical notes made by nurses, and of course have the potential to improve the development of nursing services. However, I realize that I work in a low-middle income country with significant differences in technological developments, human resources, health care facilities, and the characteristics of patients being treated, so careful consideration is needed in developing this technology.

Reflection on Data science in nursing

Name : Wannarat Jongkhetkit
Student ID : 6410430006
Date : 14 September 2022

1. What you have learned?

The result of studies in data science class. I gained knowledge about the concept of data sciences and the application of data science in communities and in hospitals. The use of modern technology to apply in collecting patient data includes personal history, medical history, health assessments, and complications, which all data is essential to promoting and protecting patient health. In addition, the ability to health assessment or assessment of the potential risks to patients from using data science will allow nurses to monitor and care for patients quickly, and effectively. reduce the danger or mortality rate that will occur.

2. What you found it is interesting?

This class made me interested and want to learn how to write a nurse note as well as record treatment information of patients on electronics. Currently, most of the multidisciplinary team that takes care of patients records what has been done and the results of patient assessments on paper. If can change record on paper to electronics. It would make data analysis more efficient. As with the study of the facilitator, the collected data can be used to predict the factors that will cause complications in the patient or reduce the mortality rate of patients. It can also be used as information to improve the efficiency of nurses and multidisciplinary practitioners.

3. What questions remain in your minds?

The question that remains in my mind is How can use technology be used in nurse notes and record treatment information of patients? As I revisited myself, I found that I didn't have the knowledge and skill enough to design or create technology to use for recording information that will lead to analysis of results. I should be learning more about the process, and methods of technology for managing big data science.

In addition, I have the view of improving the quality of work of nurses. We do not need to recruit complex records or data. If we take the basic information that we have already recorded and organize the records, a systematic analysis would be effective enough to improve nursing quality.

Reflection on attending Virtual Visiting Professor Session I

Students' name : Rinco Siregar ID : 6310430011
The title for attending : Data Science in Nursing Session I
Introduction to Data Science and Its Role in Advanced in Nursing Science
Date and Time : August 16, 2022. Time : 7.00– 10.00 pm
Speaker/Professor : Prof. Dr. Suzanne Bakken (Columbia University New York)

1. I have learned (in details)

This is my first time attending this lesson, and my knowledge is still lacking about this, especially how to analyze data using software that I just heard about, and it is very interesting for me. However, from this lesson, I learned about: the data science in nursing, application of data science, data science methods, and example of data science.

Data science is the study field that integrated domain expertise, computer science (programming skills), domain knowledge, and statistic to extract meaningful insights from data. Learning about **data science** is very interesting, because it can help the nurse to set the new model, interpret the data, understand the data, develop the intervention, improve the nurse's skill through the technology used. For example, from the **numbers as data, text as data, and images as data**; for those can analyze to become visualize data, modeling data and interpret the data by the machine learning. Data science creating interventions that assist patients in interpreting and acting on the information afforded through data science investigations extending the interpretation component of the data science pipeline (i.e., more human-in-the-loop). How it works start from gathering data, raw data, then data cleaning, visualize the data, modelling the data, interpreting the finding, and re-visiting the pipeline for fresh data. With more data, the machine learning can analyze the data and interpret the finding that can help the nurse to understand the situation from the analyzing data.

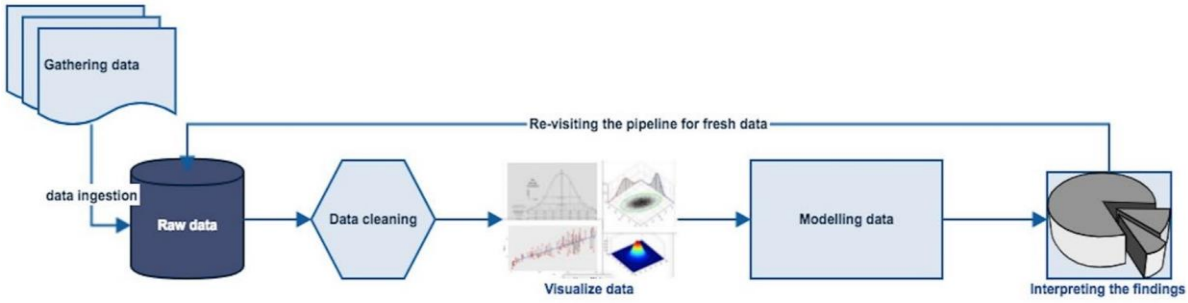
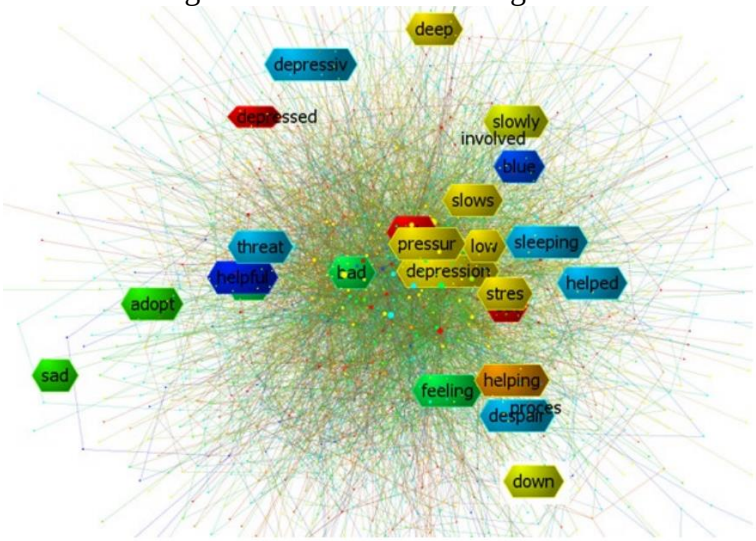


Figure: Data science pipeline. (Virtual visiting Professor Bakken, FoN-PSU, August 16, 2022).

Prof. Bakken explained the samples of data science in nursing domain included: number as data (Mining Twitter to learn about social support for caregivers of those with dementia and Alzheimer's Disease, developing the interventions to assist patients and community members interpret data, developing an early warning system for patient deterioration by Dr. Kenrick Cato session III); text as data (Natural language processing for decision support by Dr. Maxim Topaz session II); Images as data (vizHOME: A Context-Based Health Information Needs Assessment Strategy). Very amazing software !

1. This is one example of example of data science from the article (R01NR014430-03S2 (Luchsinger, Mittelman, Bakken). *Mining Twitter to learn about social support for caregivers of those with dementia and Alzheimer's* :
   From Pipeline for Twitter Analysis appear the topic modeling Content of Tweets Mentioning the Dementia and Caregivers.



The result of analysis using pipeline advance nursing science by:

- Visualization: helped the nurse gain insights for the design of online interventions for Hispanic AD/ADRD caregivers
- Content analysis: helped the nurse characterizes the importance of topics related to our phenomenon of interest (i.e., Alzheimer's and dementia caregiving), compare differences between groups (English vs. Spanish tweets), assess changes in topics over time, and discover that "one size does not fit all" (i.e., need for tailored interventions).

2. Images as data – **vizHOME***: A Context-Based Health Information Needs Assessment Strategy.* Example from the article Brennan et al, 2015: Virtualizing living and working space with the aim to intensively examine the home context of personal health information management in a way that minimizes repeated, intrusive, and potentially disruptive in vivo assessments.
   From the results of data science advance nursing science through developed set of methods for hybrid participatory design and evaluation of infographics for health literate, culturally congruent communication; produced infographics for data related to hypertension, lifestyle behaviors, dementia caregiving; designed software for production

of tailored infographics by others; Infrastructure for medical, public health, and self-management interventions.

2. **What is interesting and why (in details)**

   How to use the machine learning, what is the application or software, how to get the software, and how to read the data (interpretation the data), those are very interesting for me. But, I think, one time to learn this software is not enough. It should be practiced frequently.

3. **What questions remain.**

   I need to know more about the software that use to analyze the data science: introduction to the software, what are the packages in the software, what is the command in that software and how to use it. Hope I can reach it, so I can apply it in the next future. Thank you very much Ajarn.

Reflection on attending Virtual Visiting Professor session II

Students' name **: Rinco Siregar** **ID : 6310430011**

The title for attending **: Data Science in Nursing Session II**

Extracting Nursing Data and Information from Home Care Nursing Notes Through Natural Language

Date and Time **: August 30, 2022. Time : 7.00– 09.00 pm**

Speaker/Professor **: Assoc. Prof. Dr. Maxim Topaz**

Prof. Dr. Suzanne Bakken (Columbia University New York)

1. **I have learned (in details)**

   I learn in the data science in nursing session II about "Home Health Care Clinical Notes". Prof. Topaz introduce the software KNIME that can analyze the big data from clinical note at Home Health Care visit. Prof. Topaz et al., used the narrative data or clinical notes by Home Health Care clinicians (e.g., nurses, physical or occupational therapists, social workers, etc.) to identify patients at heightened risk hospitalization or Emergency Department. To analyze the data, they developed an analytical pipeline that included text mining and machine learning methods. The analytical pipeline consists of five components: 1. text preprocessing; 2. feature selection; 3. training of machine learning algorithms; 4. evaluation of the predictive performance of machine learning algorithms; and 5. identification of the most important features. They use the platform "KNIME" available source at https://www.knime.com/downloads. Amazing software.

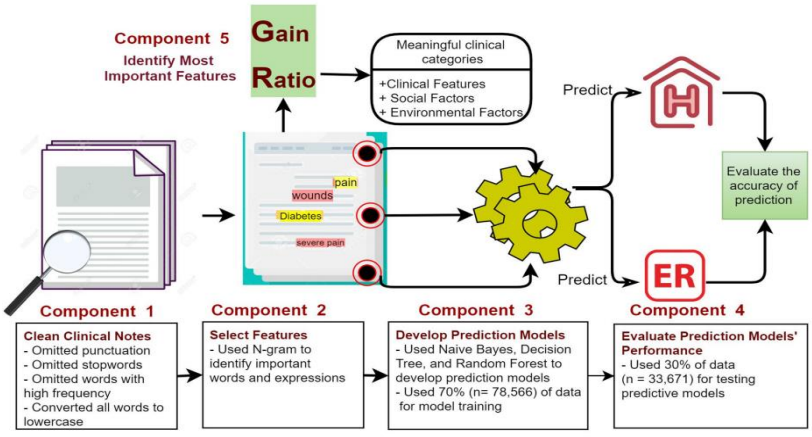


Figure. The analytical pipeline in the study by Topaz et al.

2. **What is interesting and why (in details)**

   How to analyze the data from the clinical note and the steps to analyze the data are very interesting topics.

3. **What questions remain.**

   1. I need more knowledge about the software (KNIME), and how to use it. Even though I could download the software, but I can't use it. I still can't imagine this.
   2. What are the statistic test they used?

   Thank you very much Ajarn.

Reflection on attending Virtual Visiting Professor session III

Students' name **: Rinco Siregar** **ID : 6310430011**
The title for attending **: Data Science in Nursing Session III**
Harnessing Clinical Nursing Data for Predictive Analytics and Decision Support in the Hospital Setting
Date and Time **: September 13, 2022. Time : 7.00– 09.00 pm**
Speaker/Professor **: Assist. Prof. Dr. Kenrick D. Cato**
Prof. Dr. Suzanne Bakken (Columbia University New York)

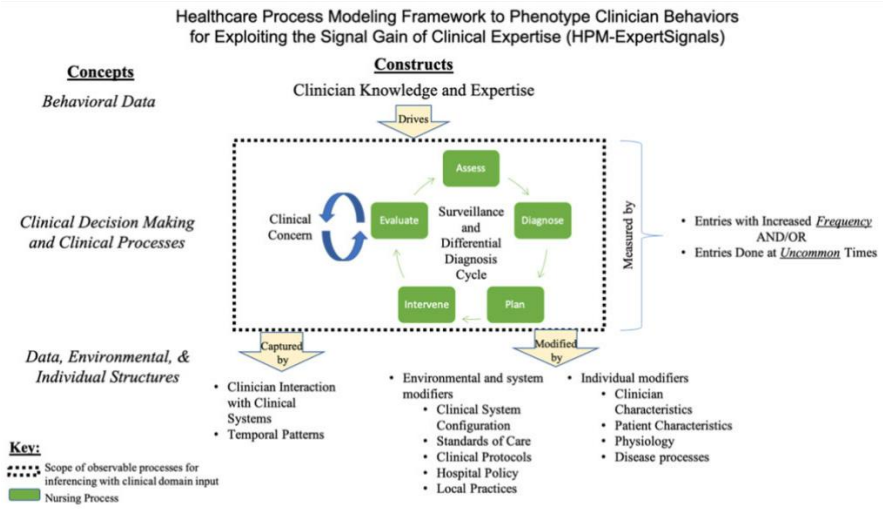
1. **I have learned (in details)**

I learn in the data science in nursing session III about HPM-ExpertSignals (Healthcare Process Modelling to Phenotype Clinician Behaviors to Exploiting the Signal Gain od Clinician Expertise), and CONCERN (Communicating Narrative Concerns Entered by Registered Nurses).

Dr. Cato et al., explain the HPM-ExpertSignals is focused on information that can be extracted from clinical data structures, generated by clinician processes, and driven by knowledge-based behavior to identify features of user interactions with clinical systems, which are patterns of clinical behavior and can be interpreted and used in prediction. The HPM-ExpertSignals developed to predict information that cannot be inferred from physiological value.

The CONCERN predictive model uses electronic health record data to identify signal of nurse's concern that a hospitalized patient. This model is being implemented as an early warning system in a user-centered designed clinical decision support tool to foster communication and increase situational awareness among interpersonal care team (physicians and nurses). Nurse continuously monitors patients and document concerns throughout the electronic health record. Themes from the development of the CONCERN model consist of 3 themes: 1) Predictive signals may be derived from clinical behaviors. The model features, such as "documentation at uncommon times" and "withheld scheduled medication. 2). Clinical domain expertise is essential for interpretations. This theme identified that the frequency of documenting respiratory rate and oxygen saturation (SpO2)

comments consistently had a strong signal. 3). Temporal focus drives clinical utility. The third theme is that time-based features, and other types of modifiers, drive the utility of healthcare process modeling in the clinical setting



2. **What is interesting and why (in details)**

   Both the HPM-ExpertSignals and the CONCERN model are very interesting.

3. **What questions remain.**

   I need more to learn the thematic analysis from simulation testing of the CONCERN model. Also, the tool of Situation Awareness Global Assessment Technique method.
   Thank you very much Ajarn.

Assoc. Prof. Dr. Kittikorn Nilmanat
(Chairperson of the Visiting Professor Project)

Reflection on Data Science in Nursing

Name: Xia Li **Student ID : 6410430018**

1. What you have learned?

After three lectures on Data Science in Nursing, I first realized the importance of nursing records. Because I often overlook their utilization and research value in my clinical work. From nursing records, clinical nurses can judge and predict what might happen to patients so that medical teams can intervene and prevent in advance. In the entire application process, mutual communication and understanding are very important, and appropriate communication skills need to be mastered. At the same time, through study, I also came into contact with relevant data analysis software, which is another new tool after SPSS analysis.

Through the information leaked from nursing records, we can carry out concept analysis of important and urgent information, or use this information to design interventional nursing research and action research, so as to develop some more appropriate nursing models, thereby improving the quality of nursing, and the patient's health and the quality of life

Another important point of knowledge learned is teamwork, data research, it is very important to form a team, and the division of labor is clear. Teamwork to analyze and process data can reduce the bias of nursing research needs and make nursing research more rigorous and effective.

2. What you found it is interesting?

In the process, I found a lot of interesting points. Such as new data analysis methods, new points of nursing research, etc. I recalled the nursing records during my clinical work, and suddenly felt that there was a lot of data worth studying, such as the cancer

patient's psychological change process, the patient's recovery process from pressure ulcers, and the patient's various pipelines such as PICC central catheters and other drainage tubes. We may be alert to some information in advance, so as to prevent many complications or prevent suicide in cancer patients through these nursing records. I will no longer ignore this clerical evidence in my future work.

3. What questions remain in your minds?

Yes, it may be due to different national conditions, so the nursing records will also be different. In my clinical work, there are indeed cases where the nursing records do not match the actual situation of the patients themselves. Every time I check nursing records, I always go to the patients personally, which leads to doubts about my use of these nursing records. But the professor told me later that communication is very important, and the nurse's education and training background should also affect the description of some data, so when writing nursing records, more than two people's judgments should be needed. Nursing records provide a very important reference value for the observation of the patient's condition. If the nursing record can truly reflect the patient's condition, it will be a very useful tool.

Reflection on Visiting Professor
Special Lecturer 1

Audience	: Asrizal
Student ID	: 6310430009
Lecturer Title	: Session 1: Introduction to Data Science & Its Role in Advancing Nursing Science
Presented	: Prof. Dr. Suzanne Bakken (Columbia University, New York, NY)
Day/Date	: Tuesday, August 16, 2022 07.00 - 10.00 pm

First: What I have learned

Doing online special lecturer:

Today, I learned a lot about Data Science and Its Role in Advancing Nursing Science.

I got a lot of information and knowledge gained in learning about the basic concepts of data science in this era of high technology in the health world, especially in the field of nursing science. Starting from data that is volume, variation, speed and the truth of the data itself that can be justified scientifically.

Nurses really need big data and data science is very useful in the world of nursing.

Each of them is essential for finding solutions to nursing problems and requires specialized knowledge. These areas include data acquisition, preparation, data mining and modeling, and model maintenance. Data scientists take raw data, turn it into various types of information with the help of technological algorithms that answer questions and find solutions to various problems in the world of nursing. Data science uses raw data to help solve problems.

So in this lecture I learned a lot about nursing technology that is increasingly developing in developed countries so that it can facilitate the patient care process and facilitate the storage process without requiring a lot of paper. Like medical record data, it really needs technology, requires big data, and software that is ready to help this process. There are so many advantages to being able to master technology in the process of storing patient data, for example in hospitals or primary care. This environmentally friendly technology is able to make nurses not tired of documenting treatment results, such as in the ICU, operating room, or intensive care room.

With this technology, data can also be used for research in nursing science, which in turn can create models and innovations in nursing services based on reliable and valid data sources. Electronic data in health services can be integrated into various kinds of technological developments, for example technology data such as research access services, repositories, and others.

Second: I found interesting

I am very interested in learning about the use of technology in nursing services because we know that in various nursing service rooms, technology is needed, both in interpreting the data obtained and in providing nursing care. I am very interested in learning it. It is also important for me to develop a nursing care center in my faculty.

Third: What questions remain

How to get this software technology? How to apply it? Of course, I need a technology course to do that.

Reflection on Visiting Professor
Special Lecturer 2

Audience	: Asrizal
Student ID	: 6310430009
Lecturer Title	: Session 2: Using Artificial intelligence to uncover hidden power of nursing data to improve patient outcomes
Presented	: Assoc. Prof. Dr. Maxim Topaz (Columbia University, New York, NY)
Day/Date	: Tuesday, August 30, 2022 07.00 - 09.00 pm

First: I have learned

Doing online visiting Professor:

Today, I learned a lot about Using Artificial intelligence to uncover hidden power of nursing data to improve patient outcomes.

Artificial intelligence can help to automatically extract important insights from nursing data to improve patient outcomes.

At the second meeting with the visiting professor, I became more and more convinced that today's health services are advancing. No wonder if developed countries have taken advantage of artificial intelligence. It is very important to be prepared to form a special method of technology-based health services in my area that is not yet technologically advanced for nursing services. Today, all data-driven healthcare services have turned to artificial intelligence. Interaction between nurses and patients with data-based outcomes Services in various advanced hospitals are based on health technology, meaning that health services between nurses and patients and other professions are facilitated by technology. The interaction between computers and natural language (natural), also known as health NLP. Of course, it aims to: teach computers to understand information recorded by doctors, nurses or patients (unstructured data: clinical notes, social media data, laboratory reports).

This application process can be made for the benefit of the patient. This NLP application can be used in all areas of nursing care for its benefits in clinical documentation and patient wound care. In essence, this learning machine can also be used for supervised and unsupervised learning.

Second: What I find interesting

I am very interested in this research. This strategy of building NLP (natural language processing) is very important. Then the simulation is carried out in a pilot study as a prototype.

Third: What questions remain

What is the initial strategy to build this digital network to increase the ability to store data science or big data for care services in hospitals or in community health service centers?

Reflection on Visiting Professor

Special Lecturer 3

Audience : Asrizal
Student ID : 6310430009
Lecturer Title : Session 3: Harnassing Clinical Nursing Data for Predictive Analytics and Decision Support in the Hospital Setting
Presented : Assoc. Prof. Dr. Kenrick D. Cato
Day/Date : Tuesday, September 13, 2022 07.00 - 09.00 pm

First: What I have learned

Doing online visiting Professor:

I attended the third meeting, which was also very interesting with the theme: Leveraging clinical nursing data for predictive analytics and decision support in a hospital setting. This material focuses more on matters related to the use of technology with several study models used in nursing services, such as Healthcare Process Modeling to Phenotype Clinician Behaviors to Exploit the Signal Gain of Clinical Expertise and the **CONCERN** Study (Communicating Narrative Concerns Entered by Registered Nurses). Nurses focus more on communication, clinical decision making, synthesis, and assessment of clinical conditions in this setting. In addition, nurses are also able to improve digital patient monitoring and documentation.

The analysis and documentation carried out by nurses is still based on technology such as NLP (natural language processing), machine learning, predictive analytics, and the Smart CONCERN app. Nurses can also take notes or nursing notes through the CONCERN model.

Second: What I find interesting

Very interesting model implemented in the CONCERN Predictive Model application

Third: What questions remain

The question in my mind is how to apply it to the case. Although this technology is not very familiar in my area, I don't know how to build it so that it can be applied in nursing services.

Best regards

Asrizal

Reflection on Data Science in Nursing

Student ID: 6410430016 **Student name:** Liping Pu

(1) What you have learned

Thank you very much for organizing these three lectures. It's a pity that I didn't attend the second lecture. Even so, I have learned a lot and provided new content for my future research and work. Social platforms, telemedicine, sports bracelets and other technologies can be seen everywhere in daily life. Twitter, medical records, and health care generate massive data every day, and the types and scale of data are exploding. Data has changed the traditional way of thinking and research model, causing unprecedented changes in emerging fields. Nursing data generally refers to all data related to nursing and life health, including data generated from hospital nursing, community nursing, nursing research or disease prevention and control.

Data enables electronic management of medical records, accurate access to information, intelligent summary and analysis, early warning of risks, and provision of intelligent nursing programs, so as to truly realize individualized nursing and information management. Big data enriches the depth and breadth of nursing research. Nursing research has been inseparable from big data. Studies have shown that using big data technology to integrate and analyze nursing records has the potential to improve the accuracy of doctors' diagnosis. Big data will explore a new mode of medical care.

The use of data can improve the data driving force and scientific decision-making power of nursing managers, and gradually shift to data decision-making. Big data is used in the refined quality management model to conduct statistical analysis on the consumption of medical resources, providing a basis for optimizing the medical security system and improving medical relief policies; At the same time, it will improve the efficiency of nursing management, affect the evidence-based practice of nurses, improve the satisfaction of doctors, nurses and patients, and ensure the safety

of nursing.

(2) What I found it is interesting

Establish disease prediction model and optimization model; Screening of high-risk groups and follow-up observation at the later stage of the disease; The nursing of special diseases, special groups (such as the elderly and children), and special moments (perioperative period, perinatal period, etc.), big data runs through the whole process of the occurrence and development of clinical events. The characteristics of cheap, rapid, optimized and sensitive determine that the comprehensive cost of big data research is excellent and widely related, and rarely involves ethical disputes. It gives full play to the maximum value of data and plays a key role in disciplinary development and disease prevention issues where there were different opinions, further communication need to be carried out, and finally a consistent result can be reached.

(3) What questions in my mind

There are some technical problems with nursing data, such as inconsistent recording format, poor accuracy, effectiveness and integrity of the data, a large number of mixed factors, and non nursing operation data can not be interpreted by machines. Therefore, nursing experts, data scientists, and statisticians need to work together in multiple disciplines to standardize and integrate nursing big data and give full play to the real value of nursing big data.

Reflection on Visiting Professor

Special Lecturers：Data Science in Nursing

Student Name: Jie Lin Student ID: 6410430012

1.What I have learned

From the three sessions of the visiting professor special lecturers of the data science in nursing, I gained a more comprehensive and systematic understanding of data science in nursing areas. From the 1st session- Introduction to data science and its role in advancing nursing science, I learned a lot about the fundamental ideas of data science in this age of high technology in the health industry, particularly in the area of nursing science which starting with scientifically justifiable data in terms of volume, variety, velocity, and the data's own veracity. Additionally, form the 2nd session- Using artificial intelligence to uncover hidden power of nursing data to improve patient outcomes, I realized that through artificial intelligence and other information means, medical care records can be used to carry out a series of research, explore the hidden scientific research value, guide the follow-up nursing practice, and make contributions to improving the quality of care. Moreover, from the 3rd session- Harnessing clinical nursing data for predictive analytics and decision support in the hospital setting, I created the pictures about the using of technology in nursing services, including Healthcare Process Modeling to Phenotype Clinician Behaviors to Exploit the Signal Gain of

Clinical Expertise and the CONCERN Study.

2. What I found it is interesting

Through attending three sessions of visiting professor special lecturers, I discovered several intriguing things, first of all, I realized the possibilities to process the data science research in nursing areas. For instance, nursing records can be able to use as the data resource. Moreover, I found many different tools (websites and applications, etc) which I can use to collect and conduct the data science study.

3.What questions in my mind

Through the study of these three sessions, I realized my own shortcomings. Due to the first contact with relevant fields and language barriers, part of the content was difficult to understand in the process of learning. Later, I also repeated understanding and learning by watching the recorded course videos and searching for self-study through the internet. Moreover, due to different national conditions, nursing records are mostly filled in the form of templates in our country. Whether the records in the form of templates can be used as a reliable source of research data is also something I have some doubts about.