Assessment of a Prototype Diagnostic Nursing Decision Support System for Inpatients with Type II Diabetes Mellitus

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Main goal of the study

- To assess nurses' opinions on the prototype of Diagnostic Decision Support System designed for inpatient with Type II Diabetes Mellitus

  - Get feedback useful and qualitative insights on identifying the requirements of a DSS for nurses
    - Advantages
    - Disadvantages
    - Other concerns

Background (1)

- For clinical practice, use of "Nursing Problem/Diagnosis"
  - There are inconsistencies in the way in which nurses use and state nursing diagnoses
  - There are the semantic ambiguity of the diagnosis language
  - Accuracy, Consistency, & Validating problems of diagnoses used by clinical nurses within units and hospitals EXIST
  - No consistently document a wide range of nursing diagnoses
  - Diagnostic expertise is a vital initial component of nursing practice

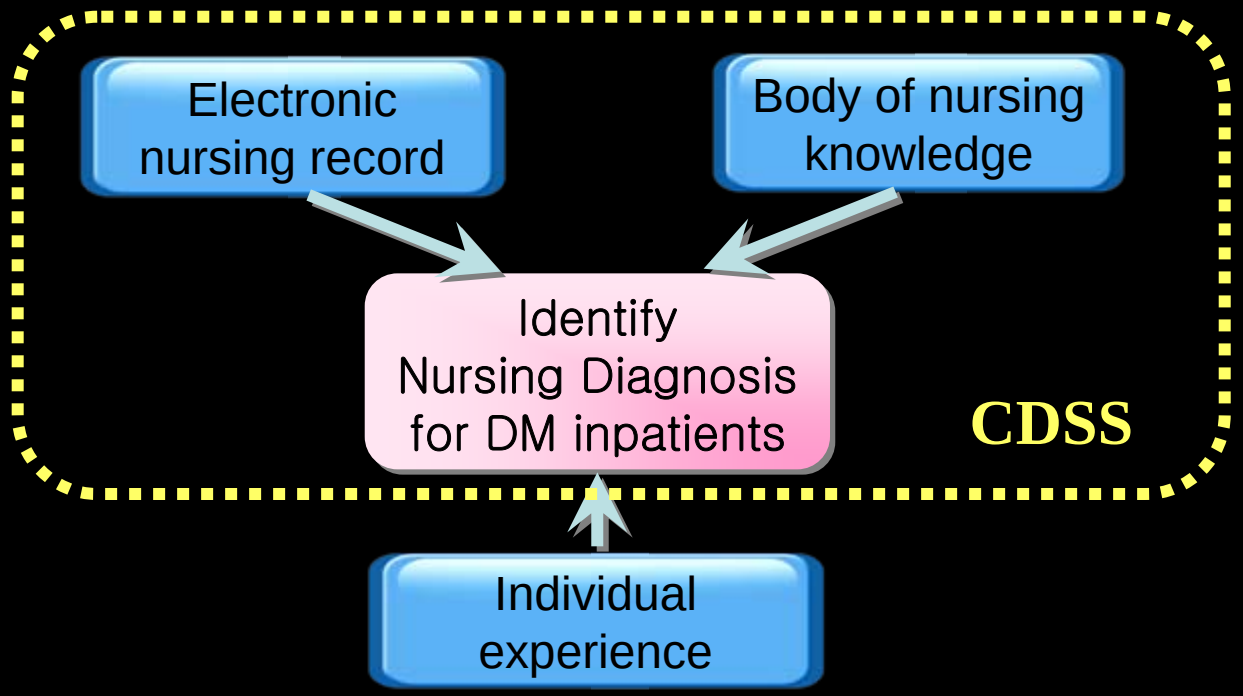
Background (2)

- Nursing Diagnosis needs critical thinking
  - "Judgment of conclusion that occurs as a result of nursing assessment"
  - Basis for selection of nursing interventions to achieve outcomes for which the nurse is accountable
  - Diagnostic skill is one dimension of expertise and diagnostic expertise has a high priority on research
  - Expertise is needed to access an extensive, organized cognitive network of specialized knowledge

  ➔ The use of Nursing Diagnosis have been limited in practice

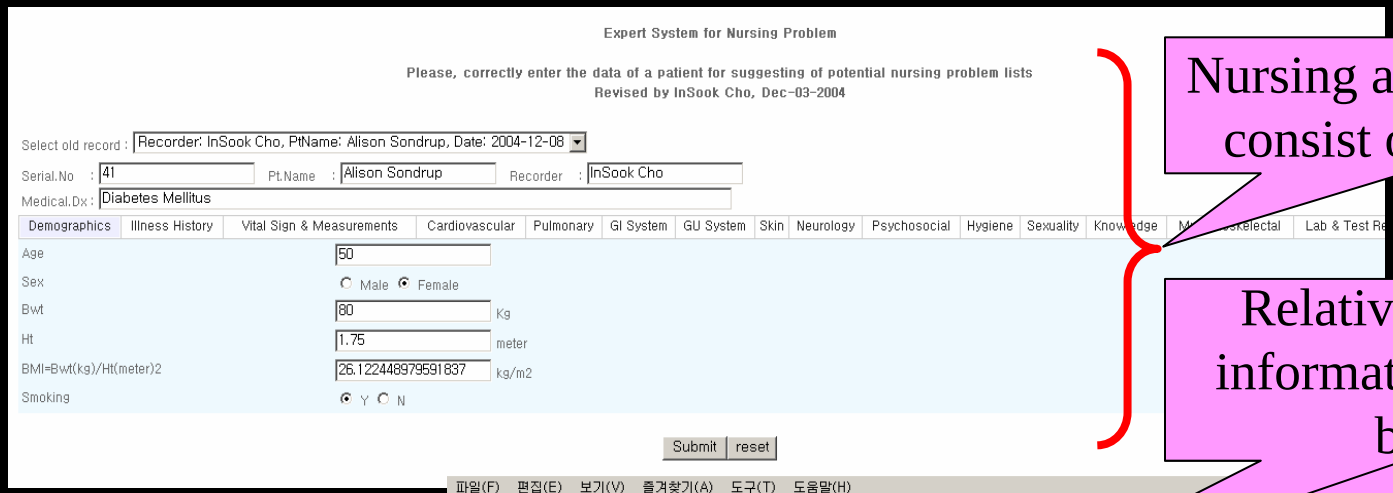
Conceptual Framework

- **Computerized Clinical Decision Support System**
  - **"…Current trend suggest that many of the formidable technological and conceptual challenges associated with representing nursing knowledge may be overcome and that decision support systems may significantly impact nursing practice……** " (Ozbolt, 1988)



Materials and methods (1)

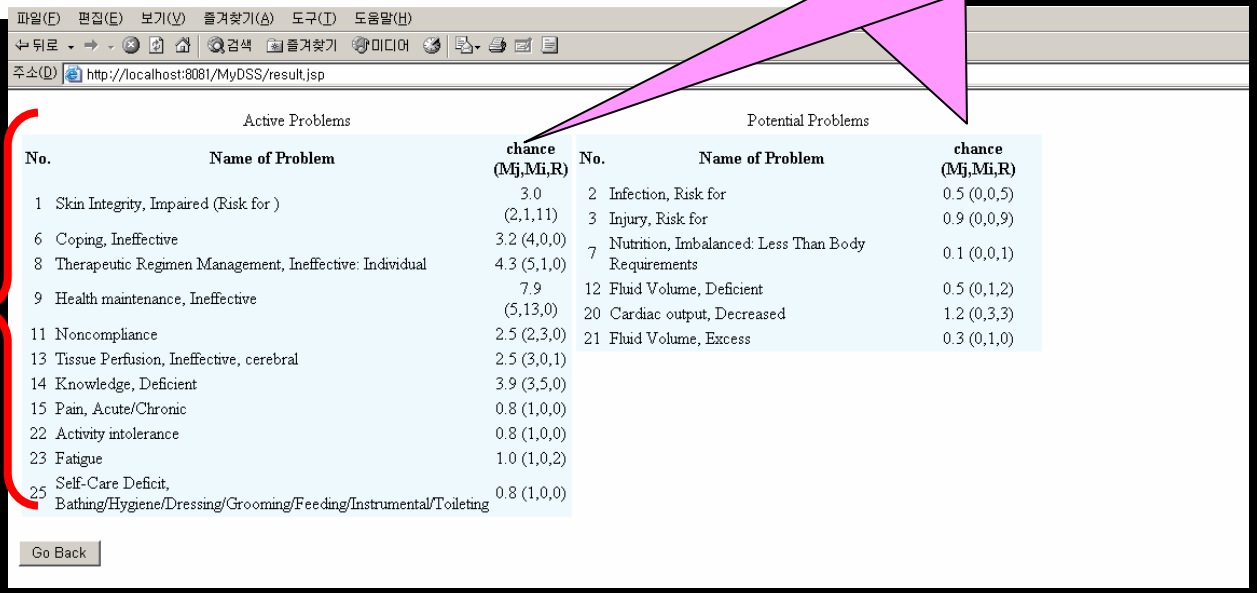
- **Web-based prototype**



Nursing assessment part: consist of 15 sub tabs

Relative probability information supported by data

The list of nursing problems suggested by system from the input assessment data



Materials and methods (2)

- Participants
  - 27 volunteer nurses with agreement to participate
    - 17 from nursing units of inpatients
    - 10 from ambulatory settings or a graduate course on nursing informatics
  - Asked them to visit and make a trial with a written scenario
- Collection of data
  - Period: Oct. 2005 ~ Mar. 2006
  - Use a Web-based online self-report questionnaire
    - Demographics
    - three open questions

Results (1)

- **Demographic and professional experience of subjects**

Variables	Subjects (*n*=27)
Average age (SD)	35.1 (4.7)
Degree of education (%)	
Master	9 (33.3)
Bachelor	17 (63.0)
Diploma	1 (3.7)
Field of working (%)	
Inpatient care	17 (63.0)
Outpatient care or Nursing Informatician	10 (37.0)
Specialty (%)	
Yes	20 (74.1)
No	7 (25.9)
Mean years of clinical working (SD)	11.1 (5.3)
Mean years of computer experience (SD)	5.6 (2.2)

Results (2)

- Nurses' responses to a suggested nursing problem list automatically generated by the system

Advantages (n)
well organized, making it easy to determined patients' problems (10)
easy to understand due to the data- driven approach (8)
convenience of obtaining the problem list automatically (4)
are able to consider all the potential relevant problems (which can be used as a reminder) (4)
good being able to select the coverage of problems (1)
very helpful being given information on the likelihood of each item on the list of problems (1)
easy to use (1)

Results (3)

- Nurses' responses to a suggested nursing problem list automatically generated by the system

Disadvantages (n)
insufficient expression of NANDA terminology (6)
tedious or difficult to input data (5)
no suggestion of nursing actions for each problem (3)
discrepancies between the priorities of suggested and selected problems (2)
errors in data input may lead to incorrect diagnoses (1)
difficult to understand the likelihood score (1)
difficult to differentiate the major, minor, and risk factors (1)
not familiar with the use of English (1)
looks complex (1)

Conclusion

- **Implications of the advantages**

  A Diagnostic Nursing DSS has the potential for

  - **Stimulating the use of nursing diagnosis based on the data**
  - **Encouraging the use of critical thinking**

- **Implications of the disadvantages**

  A diagnostic Nursing DSS should

  - **Be integrated with an EMR necessarily**
  - **Consider the use of more expressive nursing terminology than only NANDA**