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A Modeling Language for Supporting Evidence-based Nursing Processes

I-PING KO*, Jiann-I Pan
Department of Medical Informatics, Tzu Chi University, Taiwan
*s875310@msn.com

Abstract: In the past decade, evidence-based practices are attached importance to nursing care field. Evidence, such as randomized clinical trial, has presented the facts in a scientific way that offers people believable and referable guideline in clinical practices. In order to practice evidence-based nursing, practitioners must understand the concept of studies and know how to accurately evaluate these studies. However, currently the growing numbers of studies are almost published as a science article and written in English. This fact makes the evidence-based studies hard to readily understand by the nurses who work in non-spoken English countries. In this paper, we present a modeling language that based on graphical notations, called UeML, for representing the structures of nursing evidence and supporting evidence-based nursing processes. The main contribution in this proposed approach is artifact of nursing evidence represented in UeML provides a more concisely way for nurses to understand the context of evidence-based studies and apply it.
Keywords: Evidence-based nursing, unified modeling language, nursing knowledge modeling

1. Introduction

Clinical nursing care is mostly experience-based in the past. However, sometimes such experiences are not the best solution for patients. Evidence-Based Nursing or EBN is a type of evidence-based medicine that focuses on nursing field. EBN involves identifying solid research findings and implementing them in nursing practices. An underlying assumption of EBN is a science based on evidence will tell us what the most successful and cost-effective approaches to nursing care are [5]. In order to practice evidence-based nursing, practitioners must understand the concept of studies and know how to accurately evaluate these studies. However, the growing numbers of studies are almost published as a science article and written in English. This fact makes the evidence-based studies hard to readily understand by the nurses who work in non-spoken English countries. In addition to this challenge, such text-based documents are not readily available for searching and appraising, and further sharing with other colleagues. In this paper, we explored that using modeling language to address these difficulties.

2. Methods

The concept of modeling technique is wildly adopted in many science and engineering fields. A modeling is a process to simplify, represent, and visualize a complex target. Fowler [7] defines modeling language is a language to describe concepts and constructs in the problem domain. For examples, physiologist use body anatomy to introduce complex body organs; software engineer uses modeling language to specify, visualize, construct, and document a software system [16]. The objective of this study is to develop a generic modeling language for representing the structures of nursing evidence. The proposed nursing evidence modeling language, named UeML, adopts the notations in unified modeling language (UML) [14] who has features of easy use and unification, and has been

widely used in many fields such as medicine, electronic engineering, civil engineering, and so on.

Researchers usually organize their research finds, i.e., evidence, in a text-based format and depend on the published style. Evidence-based nursing studies do not have a real unified structure in common use for representing at present, first of all, we have collected a set of published studies from related nursing care studies and carry on the analysis of evidence structures (see Fig.1). Next, UeML extracts the suitable notations and diagrams from UML and integrates into the nursing evidence processes (see Fig.2). Due to the limitation of space, The features and definitions of UeML diagrams could not show here.

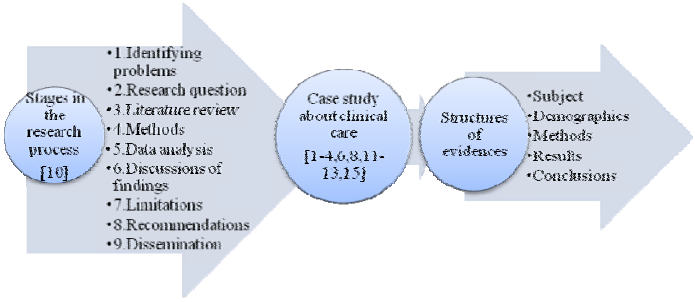

Fig. 1 Analyzing the structures from stages in the research process and case study.

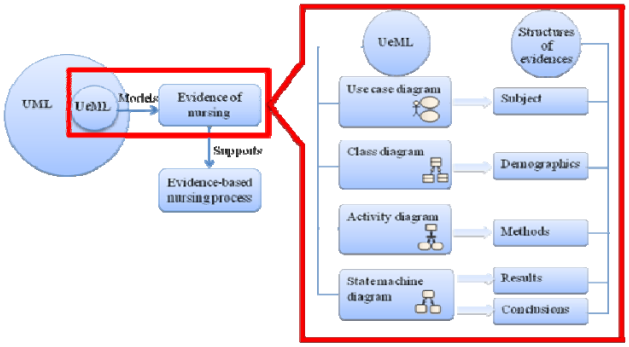

Fig. 2 Integrating UeML with evidence-based nursing processes.

3. Case study

Traditionally, literatures are text-based mostly (Left of Fig.3). Right of Fig.3 shows a UeML model we draw a literature manually based on definitions of UeML (Due to the limitation of space, only a shrink diagram).

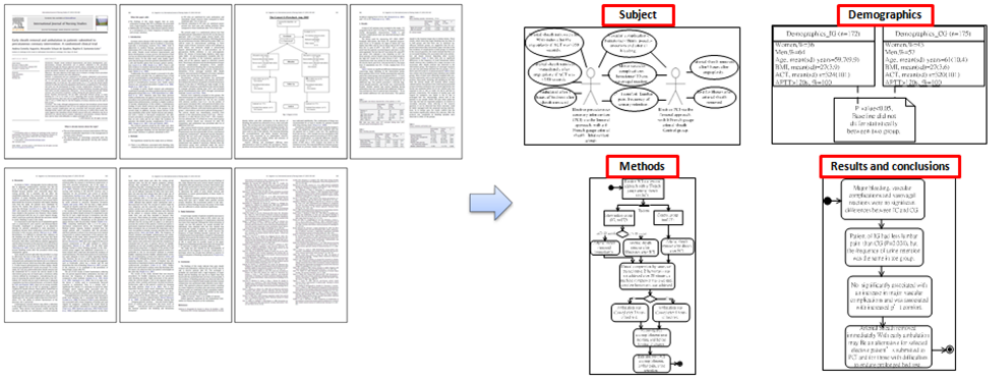

Fig. 3 Overall view of an evidence-based nursing study and UeML model.

4. Conclusions

Viewpoints from readers, researchers, and evidence-based nursing are discussed:

- UeML for readers: Graphic representation decreases the different of languages and fields. Readers can catch the architecture more easily and discuss with others through the process of drawing if the research doesn't have UeML diagrams.
- UeML for researchers: The purpose of writing studies is to share the knowledge, discuss, and apply it. Adding UeML diagrams will promote the interaction.
- UeML for development of evidence-based nursing: Knowledge translation (KT) is an iterative process that involves knowledge development, synthesis, contextualization, and adaptation, with the expressed purpose of moving the best evidence into practice that results in better health processes and outcomes for patients [9]. Optimization of the process requires engaged interaction between knowledge developers and knowledge users [9]. Researchers and readers will have a common language because UeML. Clinical nursing staffs have a clear concept from UeML model, and apply it.

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