INTRODUCTION

Medical care in the 21st century tends to be family-centered. Family-centered care can improve the communication of patients, family, and medical staff and hence improve the patients’ recovery. In the past, the nursing staff gave patients or family members nursing instruction or an introduction to the ICU environment by way of paper-based instruction, which was often found to cause difficulties (Cypress, 2013; Yorke et al., 2016). For example, using conventional paper-based instruction, it is difficult for the nursing staff to clearly explain the operating procedures and medical equipment to the patients’ families. In addition, most of the nursing staff are too busy to ensure that the patients’ families really understand the provided instruction (Fusil, 2015).

A multimedia digital e-book can let nursing staff provide health education more conveniently because it not only integrates health information, but also offers interactions and multimedia with an audiovisual instruction (Bernard & David, 2003). After thorough investigation, few studies regarding an interactive e-book for ICU health education were found, as most instruction books are given via the print or video. With the advancement of the technology, we applied an interactive e-book on ICU health education for patients’ families. It was expected that, via presenting the ICU-related knowledge in an interactive manner with multimedia, the family members of the patients could have better learning achievements and be more satisfied with the instructional mode.

METHODS AND MATERIALS

This study attempted to combine mobile devices with e-book teaching software and to use the interactive practice functions to provide the patients’ families with more learning experiences. Therefore, a multimedia interactive e-book mobile learning system was developed.

A sample of 80 ICU family members were recruited, participants were randomly assigned into either the experimental group (n = 34) or the control group (n = 46). The two groups of patients’ families had different learning activities. The experimental group used a multimedia interactive e-book mobile learning system to learn while the control group used oral one-to-one health education instruction. A certain medical health education pamphlet was chosen as the learning content. After the learning activity, the two groups completed a post learning questionnaire.

RESULTS

A combination of e-books and mobile learning in nursing instruction.

The e-book editing software (SimiMagic eBook) produced by Hamadart was used as the tool for the teaching material design. It was expected that through interactive e-books, the patients’ families could be assisted to understand the functions of the devices in the ICU, the rules of the wards, and how to handle the patient. Figure 1 shows the structure of the system study of this category.

System interface and function design

The e-book was divided into three chapters: rules of wards, devices and facilities, and comforting patients. The content was retrieved and modified from the nursing pamphlet in a northern medical center, and it was discussed, organized, and summarized with the help of three nursing professionals at that medical center. The structure of the e-book content is shown in Figure 2.

PERCEIVED HELPFULNESS

A test of the post-questionnaire of the two groups showed that no significant difference was found between the two groups (F(1,77) = 3.511, p = 0.069). That is, using an interactive e-book system for health education instruction did not affect the anxiety of the patients’ families.

LEARNING SATISFACTION

The statistical result of the experimental group’s learning satisfaction is shown in Table 5. It is found that the mean score of using the interactive e-book system helped the families discover new problems (F(3,97), p = 0.000). A deeper analysis showed that the families believed that using the interactive e-book to learn was generally beneficial for helping them to learn the health care knowledge and to learn about the ICU environment. They enjoyed reading the e-book, which could be due to its interactive learning design

CONCLUSIONS

The study is valuable since there is a lack of research on applying e-books for family members. The family members need the required knowledge for taking care of patients in ICU. From the questionnaire analysis and the knowledge test, it was found that the experimental group outperformed the control group on the acceptance (perceived helpfulness and perceived ease of understanding) of the ward regulation instruction and learning satisfaction. Although their test scores were higher than the control group, learning education instruction means that the technology-enhanced interactive e-book could be used to replace the conventional paper-based instruction to help families of patients learn the ICU regulations and knowledge. These results were in line with the findings of Heang, Yang, and Wang (2013) and Chang, Hung, Hsu, Liu, and Wang (2017), who reported the potential of using interactive e-books or multimedia for improving learners’ achievements and learning perceptions. Some limitations of multimedia interactive e-book was developed for adults. The subject is limited and the results might not be able to be generalized to some particular conditions, such as the family members of ICU patients in the neurology, obstetrics, or pediatrics units, as well as those with cancer. For future research, it is suggested that more applications and conditions can be considered by taking the features and needs of different medical departments into account (Edwards, Voigt, & Nelson, 2017; Sonneville et al., 2017). In addition, integrating effective learning tools or systems such as knowledge construction tools, into the implementation of the e-books could be a good direction for providing better instructional facilities to the families of patients.

A. 1. Using the e-book learning system to learn health education is more interesting than previous ... the e-book learning system. 
4.15 0.59 
7. I would recommend this e-book learning system to other people. 
4.14 0.65 
Table 2. The result of the post-questionnaire ratings of the two groups. A significance was found that no significant difference was found between the two groups (F(1,77) = 3.511, p = 0.069). That is, using an interactive e-book system for health education instruction did not affect the anxiety of the patients’ families.

Table 3. The statistical result of satisfaction with the interactive e-book

Figure 1. Structure of the interactive e-book system.

Figure 2. Structure of the interactive e-book system.