

Utilization Conditions of Virtual Education at Continuing Education for Nurses: A review

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Abstract

Along with advances in technology and education, applying a new method is felt to provide effective instruction. To keep pace with the growing knowledge, the service training is an integral component of education especially in the field of medical education. Because the limitations of many disciplines to attend training classes, Conventional methods will not be able to meet these educational needs. So, virtual education can be an efficient supplement for training in this area. The present study is a systematic review of relevant studies of virtual education in-service training of nurses. With the systematic review method the Persian and Latin databases: Iran medex, Iran doc, SID, CINHAL, Cochran, PubMed, Science Direct, Eric were searched by keywords: nursing, e-learning, continuous education, and virtual education that 1330 articles were found. In line with to i the entry criteria, 13 articles were selected to answer the research questions. The results indicate that the use of virtual education requires an appropriate model, the specific requirements and facilities and planning implementation in process. Virtual education is an effective way to increase knowledge and practice and can be a good complement to conventional in-service education for nurses. Although it may not have significant advantages in learning and performance improvement compared to convention educational methods, but its effectiveness can be increased significantly with proper and comprehensive planning.

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Introduction

Because of a tendency to progress in patient-centered care, nurses must constantly increase their professional competencies to ensure quality of health care. Clinical Specialists encourage nurses in this issue frequently. Continuing education has a vital role in strengthening the nursing discipline(1,2). Continuing education is defined as the educational measures to enhance or improve the knowledge, skills and the quality of medical activities after graduation (3). Today with the increasing organizations perception of the importance of lifelong learning, its role to reduce undesirable events and increased productivity, the subject of professional development of employees has found particular importance (4). Continuing education programs are an important part of the process of personal development. The purpose of these programs in nursing is to enable the nurses to sustain professional development, providing safe and competent role, innovative study of clinical performance and identify the educational needs (5, 6). The studies suggest that the continuing education increase the productivity, reduce errors and occupational accidents, improve the organizational climate, and promote the quality of nursing care. Studies show that nurses have a tendency to participate in continuing education programs and the demands for participation in these courses are increasing. However, several factors such as family involvement, shift work fatigue, low motivation and the lack of replacement staff make nurses with

challenges to access these programs (3, 7). The learning process is more complicated that it can be limited to the classroom environment (8). The need for training methods is clearly seen to respond to developing technology, overpopulation, economic problems, geographical distribution, demands for more and better education, people's willingness to self-motivation and self-learning (9). It seems conventional teaching methods cannot respond to information development and the constantly changing needs of the community. The education in medical fields does not stop after academic training, but it will continue throughout the professional work. Therefore, the familiarity with the new education methods indicates the importance of this subject (10). Today, the new advances in the field of information technology, (especially in the Internet) have provided an opportunity to nurses' education (11). Virtual education is the modern method that overcomes some of barriers in the conventional methods and provides easy and flexible access to learning (12). Virtual education are presented through the electronic media, the Internet, extranet, intranet, organized networks such as satellite broadcasting and audio disks, multimedia software and computer simulation models. In fact, virtual education is distance learning based on the technology. In other words, the education using voice, video and text will have the best quality when it was accompanied by interaction between the instructor and the learner (13). Because of job or family involvement among nurses and interfere of continuing education programs with their



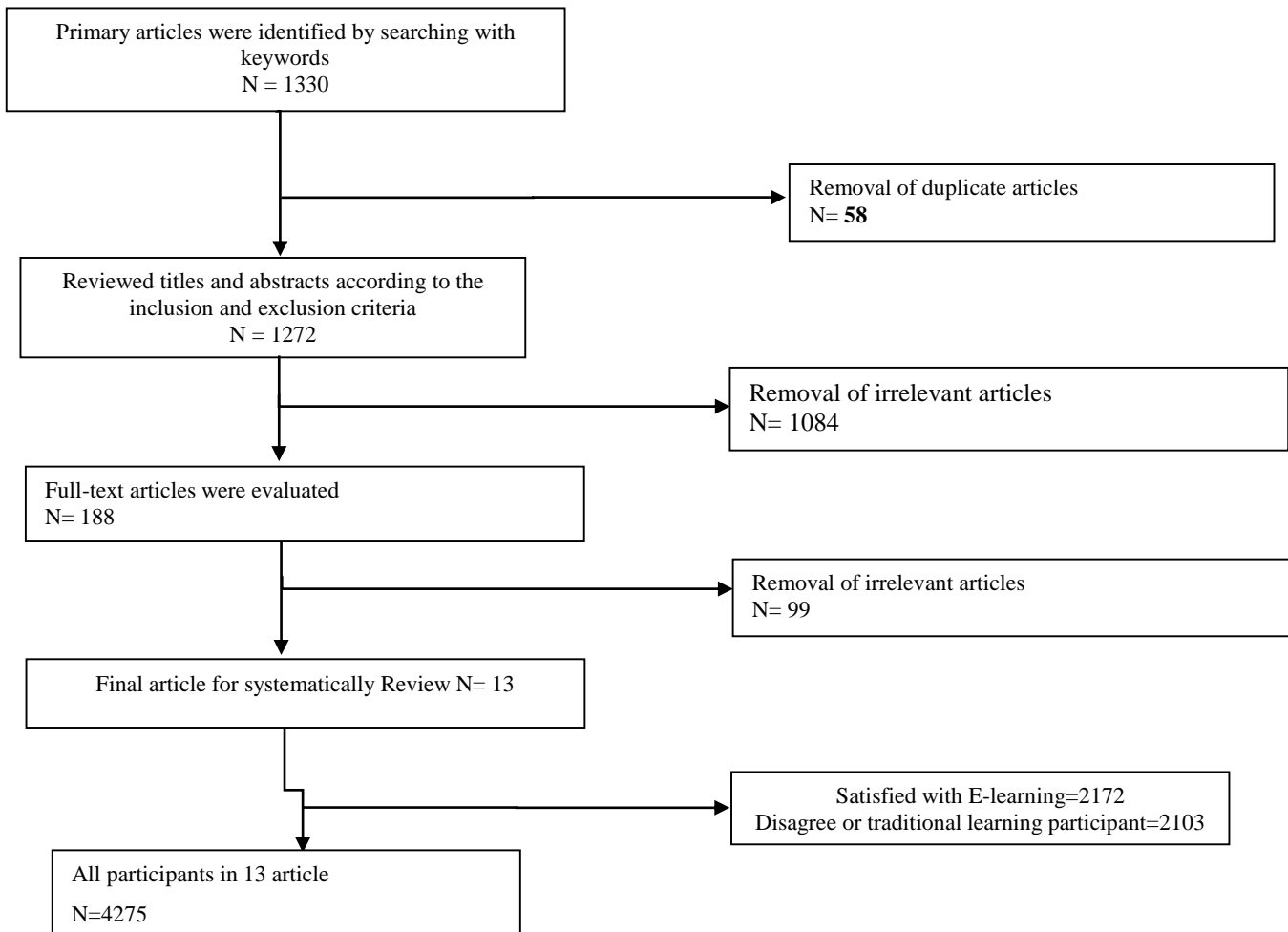
working and leisure times, the virtual education is considered inexpensive and effective solution. Using this method teacher will be benefit from multiple teaching strategies and thus active learning occurs. On the other hand the nurses' time is not wasted to participate in attending classes (7). Virtual education refers to the education that instructors and learners are separated from each other due to the physical distance but with the help of technological tools communicate with together (10). As mentioned the virtual education strategies are appropriate to enable and update nurses in the era of information explosion. In our country there is a large distant to implementing virtual education methods at in-service training for nurses. Although important steps have been made in this regard, but still many questions is raised on how to use it at in-service training for nurses. This study aimed to identify the circumstances of how to apply the virtual education in service training for nurses. For this purpose, a systematic review was conducted on related articles to find helpful guidelines in nursing education programs.

Methods

Search, retrieval, evaluation and integration of the necessary information were performed focus on the research question "What are the requirements to apply virtual education on service training for nurses?". Inclusion criteria were descriptive and experimental studies published

from 2008 to 2013 in English and Persian with its emphasis on virtual education and its application in nursing. Exclusion criteria included editorial reports, commentaries, bulletins, book review, short reports, magazines and the conferences report because due to its concise information answer to the research question and qualitative evaluation are impossible. The main steps search strategies are as follows: firstly, an electronic searches using keywords: nursing, e-learning, continues education separately and then combined searches in electronic databases (Persian: Iran medex, Iran doc, Sid and Latin: CINHALL, Cochran, PubMed, Science Direct, Eric). In the search phase, 1330 articles were identified. After reviewing the titles and abstracts, 1084 articles were excluded. By revision the full text of the articles based on inclusion and exclusion criteria and its content relevance to the research question, 96 articles were excluded again. Finally, 13 articles included at the study(Chart1). In all of this articles 4275 learners Participated. Initially, each article was evaluated using specific questions to quality assessment. To classification and analyze each item on selected articles a code sheet was used (Table 1). The findings were and analyzed based on centrality and focus on the research questions. To gain credibility findings, conclusions addition, the research team also reviewed and approved by a Specialist in Educational Administration.

Chart1. Steps of research



Results

According to research question the results indicate that the use of virtual education requires an appropriate model, the specific requirements and facilities and planning implementation in process (Table1) which are summarized as:

a. *Virtual education model at in-service learning for nurses:*

Virtual education patterns have been less studied and in the most studies one method of learning have presented. Meanwhile, top rated educational contents with the shorter duration, suitability to support learning, face to face training courses on how to use e-learning programs in continuing education, and facilitating to work with e-learning systems are essential for efficient use of this method (3). According to researches, a practical model for e-learning in the three following steps is recommended: 1. Evaluation of technology infrastructure and support in the organization 2. Support from executive senior managers 3. Assess the training needs of employees and the organization and determine the best educational method. Principles and procedures of e-learning are also proposed with the following pattern:

- A. Design and planning which includes three stages (1) a more precise of audience analysis (2) determining of educational items (3) determining the method of data presentation,
- B. Organization that consists of two steps (1) assigning topics and subjects into discrete parts (2) designing an appropriate mechanism to move between contents,
- C. Formation of expert teams to provide e-learning programs,
- D. Interaction with learners and the appropriate use of information media,
- E. Use of short-term exams,
- F. The final test of learning system.

b. *Facilities and conditions of In-service virtual education for nurses*

E-learning requires many factors for effective implementation. In a general perspective, according to studies, before using e-learning necessary factors to analysis of an educational organization can be divided into subsets: *Subsets of content:* The selection of content, topic, writing content, educational designing, conduct research and content evaluation are considered. The few studies pointed to which educational content is more relevant to virtual education. In most studies, a specific virtual education method and its performance compared to existing methods have been discussed. However, it should be noted that e-content production is one of the essential and important requirements in e-learning system. After assessment of the value and validity of the content it must provided based on multimedia attractiveness and standards because the content must engage the learner. The points that are considered in formulating any kind of content should be considered for developing e-learning content, especially in determining the needs and educational objectives (student-teacher, student-students and student- content interaction), classification of content (to understanding by learners and focus on provided content by the designers), to motivate the audience (with multiple methods such as: attention, relevance of topic to

the needs, build confidence and satisfaction), be updated, high quality of content and details (7, 14).

Learning subsets: includes the following questions: How learning system support the "weak" learners from away? What factors lead to successful learning and how we can minimize the cost and increase the effectiveness of a distance learning system to a specific audience? A change from the classroom learning to virtual web environment requires changing in thinking about teaching - learning process (14).

Regulatory and logistics subsets: Government, administrative structure, the learning organization, management structure, cooperation with other international organizations, the interior financial resources and teacher training are included in this section. Also, the necessary infrastructure for the effective and the efficient implementation of an electronic course include: the cultural infrastructure, technical infrastructure and support, human resources, infrastructure and security infrastructure at data exchange environment (14, 15). From many experts, technical infrastructure and support are more important than the content development and believed that without broadband communications, high data transfer and other technical factors it is not possible to provide efficient virtual education. Also, infrastructure related to human resources is very important. Many believe that the human resource is the primary requirement of infrastructure that should be considered in the education. Administrators, teachers, the content developers and users should be aware of the concepts, principles and practices of e-learning. Before anything else, the organizations need to accept the new learning culture to move in the right direction. The skill to work and access to computer, factors associated with attractiveness, good design and educational content have been proposed as the most important requirements for successful use of e-learning. Telecommunication systems, networks, Internet service providers, connecting educational systems to network systems are the requirements for these courses (14).

c. *Planning the implementation process*

Virtual education requires detailed and comprehensive planning. To this end, following items should be addressed in the planning: making learning culture in the organization, selection and designing appropriate content, explaining the goals of the organization, describing interactive functionality for employees, exchange views on the organization or familiarity administrative with the capabilities of learning management system and introduce it to staff, assessment of prior knowledge or pre-test of the staff at the beginning of the course, complete introduction of site facilities and how to work with it, providing a the user name and password for each of the learners, continuous assessment of e-learning during the course, holding the several sessions with managers and employees to address the continuous evaluation problems, holding the test (conditions, scores, etc.) , determining the effectiveness of the course, satisfaction of e-learning, granting certificates, the overall assessment of educational and administrative components to determine total or partial repetition the program.

Table 1. The characteristics of reviewed researches about virtual education at in-service training for nurses

Investigator(s)	year	Place	Study Type	Research question	Sample size	Instrument	Finding
<i>Mazzoleni MC, and et al</i> (20)	2012	Italy	Clinical trial	Virtual education for the nurses	2261 people	the researcher made Likert scale	The efficacy in knowledge learning and personal evaluation is acceptable. Virtual education is not suitable for all educational needs. But, findings showed that it can be <u>cost-effective</u> . However, the users must be trained for better usage.
<i>Moule, P., and et al</i> (24)	2011	Britain	Descriptive	virtual learning problems in the UK	35 people	Interview	Although acceptance and the use of e-learning are different, better learning and top education is provide by managed virtual education. E- Learning experiences and application is limited regarding to its benefits and support. It is recommended to further review systematic investigation to find e-learning requirements.
Investigator(s)	year	Place	Study Type	Research question	Sample size	Instrument	Finding
<i>Cheng, Y.-M.</i> (1)	2013	Taiwan	Descriptive	Determining the role of interaction in virtual education	218 people	the researcher made Likert scale	Interactions between learners, learners - instructors and educational system have an important role in virtual education acceptance.
<i>Cheng, Y.-M.</i> (22)	2012	Taiwan	Cross-sectional	Determining of system quality in acceptance of virtual education	320 people	the researcher made Likert scale	The quality of virtual education system, ease of use and also appropriate application of multimedia facilities have important role in virtual education acceptance.
<i>Paladino;Yara; and et al</i> (18)	2007	China	Before and after comparison	Comparison of learning in virtual and conventional education	60 people	the researcher made Likert scale	Results showed that in data collection, participants have completed a questionnaire before and after education and evaluated their knowledge. It has been confirmed each of groups had similar learning.
<i>Sheen ST, and et al</i> (19)	2008	Taiwan-China	Clinical trial	Comparison of results in virtual and conventional education	42people	the researcher made Likert scale	The objective of this study was description of nurses' experiences of e- learning program in a medical education center. Results showed efficacy of virtual education.
<i>Heydari A, and et al</i> (21)	2011	Iran	Quasi experimental I	the effect of virtual learning on report writing	61people	the researcher made Likert scale	E-learning as a student- centered method can increase documentation competency similar to lecture method.

<i>Chang WY, and et al (15)</i>	2008	Taiwan	Clinical trial	Performance evaluation of a virtual education	42people	the researcher made Likert scale	All knowledge and skills scores were in accepted range. In five courses there was difference between education and learning. Almost all nurses had full satisfaction or satisfaction of system. Educational designing process has provided an alternative system to in-service education for nurses.
<i>Farshchi M, and et al (16)</i>	2012	Iran	Clinical trial	Comparison of nursing care learning in air evacuation and transport by lecture and e-learning method	60people	the researcher made Likert scale	The effectiveness of software method is determined. So, due to multimedia efficacy at recall stage and its cost effectiveness it is suggest at in-service education for nurses.
<i>Vahabi S, and et al (9)</i>	2011	Iran	Quasi-experiments I two groups	Comparison of virtual and conventional education methods on learning triage	90people	the researcher made multi choice questionnaire	Results showed the efficacy of both lecture and multimedia software. But, regarding to virtual education specifications it is recommended to learning based on interest, cost effectiveness, efficacy, accessibility, flexibility, proper designing, student-centered and comprehensiveness.
Investigator(s)	year	Place	Study Type	Research question	Sample size	Instrument	Finding
<i>Khatooni A and et al (7)</i>	2010	Iran	Quasi-experiments I before	Comparison of virtual and traditional education on nurses' knowledge about Bird Flu	140people	Questionnaire	Internet can be used effectively as conventional to provide continue education programs. Regarding to its high benefits it is suggested to future in-service educations.
<i>Asadi reza and et al (3)</i>	2012	Iran	Descriptive	The Utilization of Web-based Continuing Medical Education Courses in Mashhad University of Medical Sciences and its Relationship with Course Characteristics	824people	-	It seems that better inform, provision of high level educational content, less duration, proper support of learners, and In-service classes on how to use of e-learning education as continue education and ease of use are necessary items to effective application of this education method.
<i>Holly Blake BA and et al (23)</i>	2009	Britain	Descriptive	Knowledge of nurses in relation to learning to learn	102people	Questionnaire	The most of nurses have positive attitude to pedagogy items in education technology. It is necessary to increase learners' knowledge to more acceptance of virtual education.

Discussion (developed)

However, virtual education has been introduced as a useful and effective method in nursing education but a comprehensive model has not been provided in this regard. And having appropriate model is prerequisites to success of the virtual education method. Because of much occupation among nurses and the impossibility of regular presence in-service training courses, it seems the method of virtual education be appropriate to this situation. But virtual education model and its content should be flexible and to obtain desired results should be designed by the needs and characteristics of learners in the specialized form (7, 13, and 15).

Farshi Darzi and et al(2011) show in their study that Because of more learning consolidation with software package than lecture suggested that use of E-learning is helpful and time and energy can be saved(16).

Chang, Ying Ju(2012) reveal in his systematic review that situated e-learning is an effective method to improve novice learners' performance. The effect of the situated e-learning on the improvement of cognitive ability is limited when compared to traditional learning. Situated e-learning may be a useful adjunct to traditional learning for medical and nursing students, but does not appear to have any benefit over traditional learning methods for practicing clinicians(17).

Similar to Padalino and Heloisa(2007) study, the result of this systematic review indicates E-learning in nursing provides optimization and flexibility of the time spent in training courses. In addition, it emphasizes the importance of implementing new tools in nursing education, which should fit each individual's learning dynamics and be a fast and efficient way to train and capacitate professionals. Hence, it is concluded that adopting *e-learning* in the continuing education process in nursing represents a strong impact on the improvement of knowledge management, care quality and client satisfaction(18). Also Sheen, Shu-Tai Hsiao, et al (2008) showed that future nursing educators may select courses such as teaching and learning and communication with caution when applying e-learning to continuing nursing education in the nursing clinical ladder system. Overall, findings are very positive and in favor of applying e-learning. The application of e-learning methods to continuing nursing education is possible and may be extended in the future to all levels of the nursing clinical ladder system(19).

In different with our result Mazzoleni, M. Cristina, et al(2011) say that E-learning is not appropriate for all the educational needs and is not a panacea, but the reported results point out that it may be an effective and economically convenient mean to support massive educational interventions reaching results hardly attainable with traditional education. Users should be better educated about how to exploit online education at best(20).

Results of the Heydari's study (2011) showed that e-learning method as a wide learner-centered educational method could increase the competency of the nurses in documentation as equal as lecture method. Therefore, electronic education can be used for facilitating nursing

educational programs(21). But Lahti, Mariand et al(2014) reveal that even the e-learning is not superior to traditional learning it can, however, offer an alternative method of education. Lastly, we assumed that e-learning has a positive impact on learners' satisfaction with education(22).

However Blake Holly(2009) showed that a significant proportion of staff lacked confidence in engaging with these methods, staff did not fully utilize the range of technologies available, and not all staff recognized the pedagogical value of e-learning(23).

Through identifying strategic direction and drawing together key resourcing and support, many of the issues currently impacting on development and use may be reduced and e-learning and teaching use optimized(24).

Considering that in virtual education the teacher- student interaction is reduced, study results emphasize the weaknesses of designing in this type of education. In this regard, McKenzie and colleagues (2011) emphasize to decreased interaction between teacher- student and students with each other in the designing educational methods (1, 16). Also, study results indicate limitations must be given in the designing of virtual education. Bloomfield and Jacqueline (2013) showed fatigue caused by working with virtual education systems, shoulder pain from sitting position, and damage to the eyes by looking at the bright screen and inadequate familiarity to work with them can reduce the satisfaction of these courses (17). In the virtual education designing the factors such as flexibility, interactivity, openness in the learning environment and the sharing resources should be considered.

Zhang and Hwang (2010) have emphasized the following: (1) E-learning as a flexible learning provides an excellent opportunities for learners. So that students can learn at any time and every place according to their speed and also learn the techniques in their own preference (2) The Internet has many potential to interaction and communication (3) Learners can interact with the teacher and their classmates simultaneously (4) the quality of educational resources should be promoted through an online database and resource sharing by students and teacher locally and internationally (5) E-learning environment is open to all persons regardless of age, gender, religion, race, ethics and beliefs (18). One of the important approaches in the designing of e-learning model is considering to combination of education and diversity in the learning environment. Diverse learning environments such as the Internet, Intranet and computer allow learners to use of diverse environments according to the theory of learning at any time and place (19). Study results indicate that the learning model must be design based on background and problem solving skills. In this regard, the results of Chan (2012) suggests that the purpose of learning at in-service education of nurses should be learning of new sciences, more effective use of existing knowledge and problem solving skills to resolve the clinical care problems and interaction with patients (20).

Conclusion

Due to excessive to preoccupation of nurses the virtual

learning can provide easy access to education and personalize learning to nurses. Although e-learning is an effective way to raise awareness and improve nursing practice and can be a good complement to in-service education for nurses, But in the context of virtual education there is not a systematic and planned model and this issue has been investigated in few studies. Although the results of this systematic study provide valuable information on how to use e-learning, however, due to the lack of information on appropriate learning content and the effective models in its application it is felt further researches in this field.

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