ORIGINAL ARTICLE

مقارنه تأثیر اسلوبین التعلیم الالکترونی و المعل التعلیمی علی المستوی العلمی و العملی عند طلاب کلیه التمریض فی مجال لجم العفونه فی المستشفی

التمهید و الهدف : إن الإطلاع علی الاسالیب الحدیثه فی مجال التعلیم و مقارنه هذه الاسالیب تساعد المدرسین علی استخدام اسالیب افضل فی المستقبل.إن الهدف من هذه الدراسه من هذه الدراسه هو مقارنه اسلوبین التعلم الالکترونی و المعل التعلیمی علی المستوی العلمی و العملی عند طلاب کلیه التمریض فی مجال لجم العفونه فی المستشفی .

الأسلوب: تمت هذه الدراسه علی مجموعتین قبل الاختبار و بعد الإختیار. و کان اختیار الطلاب علی شکل قرعه فی فریقین تعلیم الکترونی و تعلیم معملی . تم اجراء معل تعلیمی خلال یوم لإحدث الفریقین و اما الفریق الثانی استعلم ملف تعلیم عبر البرید الالکترونی . تم تقییم العلم و العمل قبل و بعد اسبوعین من تعلیم المجوعتین و من ثم تم تجمیع المعلومات عبراستمارات و استخدم برنامج SPSS18 لتحلیل المعطیات .

النتائج : اشار الإختبار الی أن مجموعه الالکترونیك حصلوا علی علامات افضل من مجموعه المعل التعلیمی ($p<0.001$) و علی المستوی العملی لم یکن هناك فروق احصائی واضح فی المجموعتین ($P=0.6$) .

الإستنتاج: نظرا الی نتائج هذه الدراسه نستطیع استخدام الأسلوبین فی مجال رفع مستوی مهارات طلاب المتریض و لکن ترکیب هذین الإسلوبین یسهل رفع مستوی المعلومات لاجل الحصول علی مهارات افضل .

الکلمات الرئیسیه : العلم ، العمل ، الکترونیك ، معملی

Comparing the Efficiency of Electronic Learning and Workshop Learning on Knowledge and Performance of Nursing Students in Controlling Nosocomial Infections

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Introduction: Being familiar with new teaching methods and comparing their result helps teachers achieve better planning for applying such methods in the future. This study is aimed on comparing the efficiency of electronic learning and workshop on knowledge and performance of nursing students in controlling nosocomial infections.

Methods: Two groups were selected by pre-test post-test method. Students were randomly divided into two groups of electronic and workshop learning. A one-day workshop was held for the workshop group, and the electronic group received slides via email. Knowledge and performance of the two groups were evaluated and compared with each other using questionnaires prior to and after two weeks, and the data were analyzed by SPSS 18.

Results: Students of the electronic groups achieved better scores compared to the workshop group ($P<0.001$). Regarding performance, there was no significant difference between the two groups ($P=0.6$).

Conclusion: According to the results of this research and other studies, both workshop and virtual methods can be used to educate nursing students, but it seems that the combination of the two methods would be more effective to increase knowledge and skills.

Keywords: Knowledge, Performance, Electronic, Workshop

اسپتالوں کی عفونت کو کنٹرول کرنے میں الکٹرانیک تعلیم اور ورک شاپ کی روشوں کا جائزہ۔ اس تحقیق میں نرسنگ اسٹوڈنسٹ نے شرکت کی

بیک گراوند: اس تحقیق میں پری ٹسٹ اور پوسٹ ٹسٹ کے طریقے سے طلبا کا انتخاب کیا گیا تھا۔ اور قرعے کے ذریعے انہیں الکٹرانیک روش اور ورک شاپ روش کے گروہوں میں تقسیم کیا گیا۔ ورک شاپ گروپ کے لئے یک روزہ ورک شاپ لگائي گئی اور دوسرے گروہ کو ای میل کے توسط سے اسلائیڈیں بھیجی گئیں۔ ان دونوں گروہوں کے تعلیمی معیار کو ان روشوں سے پڑھائے جانے کے ایک ہفتےقبل اور دوہفتے بعد جانچا اور موازنہ کیا گیا۔ ڈیٹا کا تجزیہ ایس پی ایس ایس سافٹ ویر سے کیا گیا۔

نتیجے: پری ٹسٹ اور پوسٹ ٹسٹ کے نتائج سے معلوم ہوتا ہے کہ الکٹرانیک روش کے گروپ کے نمبر بہتر تھے۔

سفارشات۔ان نتائج سے معلوم ہوتا ہےکہ دونوں روشوں سے طلباء کو بہتر طریقے سے تعلیم دی جاسکتی ہے اور انہیں مہارتوں سے آراستہ کیا جاسکتا ہے۔ البتہ دونوں روشیں مزید بہتر ثابت ہوسکتی ہیں۔

کلیدی الفاظ: الکٹرانیک تعلیم۔روش، ورک شاپ ۔

مقایسه تاثیر دوروش یادگیری الکترونیک وکارگاهی بردانش و عملکرد دانشجویان پرستاری در کنترل عفونت های بیمارستانی

زمینه و هدف :اطلاع از روش های نوین آموزشی و مقایسه نتایج آموزش این روش ها با یکدیگر به مدرسین کمک میکند تا در خصوص تهیه و اجرای دوره های آتی آموزش از روش های موثر تری استفاده کنند .هدف این پژوهش مقایسه تاثیر دوروش یادگیری الکترونیک وکارگاهی بردانش و عملکرد دانشجویان پرستاری در کنترل عفونت های بیمارستانی میباشد.

روش: در این مطالعه با طرح دو گروه پیش آزمون –پس آزمون بوده است . دانشجویان مورد مطالعه به صورت قرعه کشی به دو گروه اموزش الکترونیک و آموزش کارگاهی تقسیم شدند . برای گروه آموزش کارگاهی کارگاه ۱ روزه برقرار شدو گروه آموزش الکترونیک اسلاید های آموزشی را به صورت ایمیل دریافت کردند. و دانش و عملکرد آنها .قبل و دو هفته بعد از اموزش درهردوگروه با استفاده از پرسشنامه میزان دانش و چک لیست عملکرد سنجیده و مقایسه شد.و سپس داده ها توسط spss 18 تجزیه و تحلیل شد.

یافته ها :طبق آزمون قبل وبعد نتایج نشان داد که گروه الکترونیک نمرات بهتری نسبت به گروه کارگاهی بدست آوردند.

($P < 0.001$) و نتایج در رابطه با عملکرد نشان داد که بین نمرات دو گروه تفاوت اماری معنا داری وجود ندارد. ($P=0.6$)

نتیجه گیری : با عنایت به نتایج مطالعات بیان شده و نتایج مطالعه حاضرهم میتوان از روش کارگاهی و هم از روش آموزش مجازی در اموزش مهارت ها به دانشجویان پرستاری استفاده نمود ولی به نظر میرسد ترکیب این دو روش اموزشی ممکن است سطح دانش را برای دستیابی به مهارت بیشتر تسهیل کند.

واژه های کلیدی : دانش ،عملکرد ،الکترونیک ،کارگاهی

INTRODUCTION

Nosocomial infection,which occurs during patient care, is considered as one of the major issues in health centers. The infection rate in developing countries is reported more than 25%. Almost 33% of these infections can be prevented by education (1). The responsibility of preventing nosocomial infections ison all people having direct contact with patients, potentially being one of the most effective factors for preventing such infections (2). Members of the health group, especially nurses, can play an important role in preventing and controlling these infections (3). Since students will possess professional positions as nurses (4), it is a necessity to educate them regarding infection control. The nosocomial infection control program includes: educating employees and students, constantly taking primary infection control measures, and systematic monitoring (1). Today, education, as a basic human right, is considered to be the factor for change and social progress (5). The aim of nursing education is that students gain proper knowledge and skills. Many professors are seeking for effective teaching methods that can educate proper knowledge and clinical skills to students.

In 2003, the medical federation introduced education standards in medical sciences and recommended that faculties perform new methods in a way that studentswould be responsible for their own education and prepare them for self-learning and learning in life (6). The teaching method ismostly lecturing (7). In this method, information is presented before the question is formed in the learner's mind, thus, the learner is less active in the learning process. However, in learner-centered methods or methods in which the learner is active such as group discussion, problem solving, or self-learning, the question is formed in the learner's mind first and then the learner looks for the answer (8). Many psychologists believe that the learning opportunities must be organized in a way that learner can learn and act according to his/her abilities (9). Traditional teaching methods encourage passive learning. Such methods do not take individual differences and learners' needs, problem solving of creative thinking, and other skills of high cognitive level into account. Today, new progress in information technology, especially the internet, has made proper educational opportunitiesavailable (10). Thus, many professionals have emphasized the necessity of modifying the traditional teaching methods (11).

Electronic learning is considered as an individual education type, enabling learners to achieve the educational goals based on their own talents and skills. In fact they learn how to learn, which is one of the educational goals. Education is a life-time process. Researches indicate that electronic learning is a successful and efficient method if being associated with proper contents and evaluation, and it is recommended to be used in Iran's educational system (12). Workshop learning is a new and effective method in teaching and learning. Workshop is based on problem solving. It applies different types of group discussion techniques to involve people. The audience actively participate in the discussion and choose the best solution together (13). Researches have shown that adults can learn better if they are actively participated in the learning process (14). The most important feature of the workshop method is the active participation of the audience in the group discussion and encouraging them to critical but constructive thinking, which leads to better health-care services in the country (15).

According to personal experience, lack of a separate course as preventing and controlling infections and considering the importance of preventing nosocomial infections and the role of knowledge and performance of nurses in preventing and controlling such infections, nosocomial infections are investigated in the current study. Since new educational methods motivate learners which lead to improving knowledge, behavioral change, improving performance, skills, and saving time and manpower (16). This study is aimed on comparing the efficiency of electronic learning and workshop on knowledge and performance of nursing students in controlling nosocomial infections.

METHODS

This is a quasi-experimental study. Sample size and population size are equal, including 60 nursing students of Kerman nursing and midwifery school in their third semester.

Students were informed about the research through the education department and they were asked to be present in the class at a specific date. In this session, the knowledge pretest was held via questionnaire and the aims of the study were explained and their consent to participate in the study was obtained.

At the end of this session, students were randomly divided into two groups of electronic and workshop, with 30 students in each.

Students of the workshop group were asked to participate in a one-day workshop at a specific date. Contents of the workshop included:

1. The definition of nosocomial infection
2. Needle-stick injuries
3. Protective equipment
4. Hospital waste

Students could ask questions and take notes during the workshop session. The electronic group members who were not present in the workshop, received the same content via email and were given phone number and email for contact in case they had problems. Two weeks after the education, the two groups were asked to answer the knowledge questionnaire. Regarding performance assessment, checklists were given to the teachers and they checked the specific items according to the students' performance.

Questionnaires were demographic, and researcher-made knowledge questionnaire consisting of multiple-choice questions.

The researcher-made checklist was developed using standards mentioned nursing books and included items related to infection control.

To investigate the validity of the study tools, comments of 10 faculty members were used, content validity index was

0.8. The reliability was calculated using internal correlation. The questions were given to 20 nursing students in their sixth semester. The answers were in the form of true or false. SPSS version 18 was used to test the reliability of the questionnaire. Cronbach's alpha coefficient was 0.75. To test the reliability of the performance questionnaire, simultaneous observation of the researcher and one of the teachers was used, kappa's coefficient was 0.85.

To analyze the knowledge evaluation answers, 1 was assigned to the right answer and 0 to the wrong. Then the sum of right answers was calculated and assigned as the score of each student. Mean and standard deviation was calculated for each group. Normal state of the data was confirmed by Kolmogrov-Smirnov test. To compare scores prior to and after education in the two groups, independent and paired t-tests were used. Performance scores were in the form of yes or no answers; if the answer was yes score 1 was assigned, otherwise score 2 was assigned to the student, and the data were analyzed.

Ethical considerations in the current study were as follows:

The following were obtained:

1. Written agreement from the center for studies' development
2. Written introduction from the center to the school of nursing
3. Consent of the deputy of education
4. Oral consent of the students

At the end, the subjects and all other people involved in the study were appreciated for their participation. The current study is approved by the deputy of researches and technology (code: 92/47)

RESULTS

In this study, underlying variables including access to the internet and computer were the same in the two groups. Variables such as sex, age, skills in using computer were investigated in the subjects and no significant difference was observed.Subjects were 60 nursing students in two groups of electronic and workshop, mean and standard deviation for the students' ages were 19.9 ± 7.1, 68.9% female and 29.5% male.

According to table 1, mean and standard deviation of the students' scores in the electronic learning method regarding nosocomial infections was 15 ± 1.9 after education and in the workshop method it was 13.28 ± 1.7. Results of the t-test showed that there is a significant difference between learning by the two mentioned methods and the electronic group obtained better scores.

According to table 2, there is no significant difference between the scores of the two groups prior to education (P=0.7). Mean and standard deviation of the students' performance regarding nosocomial in electronic group was 63.3 ± 6.1 and in workshop group was 63.9 ± 3.6. Results of the t-test showed that there is no significant difference between learning level of the two groups and both methods had the same impact on improving students' performance.

DISCUSSION

Current study is aimed on comparing the efficiency of electronic learning and workshop on knowledge and performance of nursing students in controlling nosocomial infections. Results of table 1 and the t-test indicate that there is a significant difference between students' scores in electronic and workshop groups (P<0.001) and electronic group obtained better scores.

These findings are in accordance with results of the studies confirming electronic learning as an effective method in nursing education.

In a study by Jenkins in 2008, a significant difference was observed between the two groups and the electronic group obtained better scores (17). Another study by Abdolaziz in 2011 showed that according to the post-test scores there is a significant difference between the study group and the control group, and that study confirms that electronic learning is an effective method in nursery education (18).

Table 1.Mean and standard deviation in scores of knowledge evaluation regarding controlling nosocomial infections in electronic and workshop groups

Scores - group	Mean (Standard deviation)	T-test result
Pretest - electronic Pretest - workshop	7.3 (2.2) 7.5 (2.8)	P=0.8
Post-test – electronic Post-test – workshop	15 (1.9) 13.28 (1.7)	P<0.001

Table 2. Mean and standard deviation of performance scores in controlling nosocomial infection in electronic and workshop groups

Scores - group	Mean (Standard deviation)	T-test result
Pretest - electronic Pretest - workshop	3.3 (6.9) 40.1 (4.9)	P=0.7
Post-test – electronic Post-test – workshop	63.3 (6.1) 63.9 (3.6)	P=0.6

In a study by Hart et al. in 2008, nurses' knowledge regarding evidence-based nursing was improved after using computer (19).

According to the results of the mentioned study, the researcher believes that electronic learning is a type of self-education in which the learner is responsible for his/her own learning. Some professionals believe that learner autonomy is the center of learning. In electronic learning, the learner can access any content at any time. Since the student is actively involved in the learning process, deeper understanding and knowledge is achieved through virtual learning. Convenience and easy access to educational materials through the computer, improves the ability of learning in students.

Education in one session in the classroom or workshop is boring for the students, and the requirement to learn at a specific date and time limits the learner's abilities (12).

However, a study by Reime et al. in 2008 reported that the lecture group obtained better scores than the electronic group (1). In another study by Chang et al. in 2009 the traditional group gained better scores than the electronic group (20).

These studies state that explaining the course material in detail by the teacher in the traditional method facilitates the learning process and believe that the interaction between teacher and student and even students with each other is vital in learning, which is absent in self-learning. They also explained that in the electronic method, students may get busy searching in the internet, chatting with friends and other unrelated topics.

However, even in the classroom or workshop it is possible that the student may dream or think about other things. One other reason that the scores of the traditional group is lower in these studies, is the low level of computer skills in students.

According to table 2 and results of the t-test, performance of students in both groups was significantly improved after participation, but no significant difference was observed between scores of the two groups ($P<0.001$).

A study by Jeffrirs in 2003 on 77 nursing students regarding electrocardiogram skills, the results indicated that both groups had similar abilities, which confirms the above finding (21).

Elfessi in 2004 showed that there was no significant difference between performance scores of the students (22).

In a study by Engum in 2003, 163 students were educated traditionally and virtually regarding insertion of intravenous catheter. The results showed that students learning was similar in both groups, and the knowledge and clinical skills were similarly improved in both groups (23).

However, a study by Dixon et al. in 2011 showed that an electronic education course improved students' knowledge and clinical skills significantly (24). A research by Kown et al. in 2008 indicated that virtual learning can be effective in nursery education programs. Also, virtual classes reduce the lecture time and improves the real learning time, leading to better practical learning (25).

In a study by Kangarih in 2007 no significant difference was observed between lecturing and electronic learning, but the performance scores were higher in the traditional group than the electronic group (26).

One of the reasons for this is that students are more familiar with the traditional classroom and lecturing method comparing to the electronic method and the students can ask any question at any time for better and clearer understanding of the topic, while in the electronic method, students must wait until they meet their teacher or ask their classmates for problem solving.

According to the results of this research and other studies, both workshop and virtual methods can be used to educate nursing students, but it seems that the combination of the two methods would be more effective to increase knowledge and skills. One of the issues of this study was the inability to use email by students, which was instructed to them by the teacher. Also, limited number of students was another issue, bigger sample size is recommended for future studies.

According to the studies regarding electronic learning and the results of the current study which indicates the positive impact of this method in improving students' knowledge, electronic learning can be used to educate students. Using this method, teachers can apply different strategies to present the course material and the learners are actively involved in the process. Also, considering the wide and inevitable use of internet in todays' world, it is a necessity for the students to be able to learn through new methods and apply them to improve their knowledge and skills. Electronic learning, as a flexible method, enables students to access to the course material anywhere at any time. The workshop learning method actively involves students in the learning process, too. Thus, it is recommended to use electronic and workshop methods in combination with the traditional method in educating nursery to improve students' knowledge and performance.

Conflict of interest: The authors declare no conflict of interest.

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