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Website: www.jehp.net
DOI: 10.4103/jehp.jehp_985_20

Comparison of two new educational techniques on knowledge of nurses about cerebrovascular accident nursing care in emergency department

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Abstract:

BACKGROUND: One of the important challenges faced by health-care system is to raise the level of knowledge of nurses about cerebrovascular accident (CVA) nursing care in the emergency department. Therefore, the aim of this study was comparison of two new educational techniques (noninteractive multimedia learning and workshop) on knowledge of nurses about CVA nursing care in the emergency department.

MATERIALS AND METHODS: This experimental study was conducted with a two-group design. Sixty-four eligible nurses working in the emergency department in selected hospitals affiliated to Isfahan University of Medical Sciences, Isfahan, Iran, were selected as the study participants. Nurses were randomly assigned into two groups of noninteractive multimedia ($n = 32$) and workshop ($n = 32$) using random number table. The data-gathering tools including a demographic questionnaire (6 items) and knowledge questionnaire (24 items) were completed before and 2 weeks after the intervention in both the groups. Data were analyzed using SPSS 18 and descriptive (mean and standard deviation) and analytical statistics (ANOVA, independent t -test, and paired t -test). The level of statistical significance was $P \leq 0.05$.

RESULTS: The result shows that independent t -test showed that there was not a significant difference between the mean total scores of nurses' knowledge before intervention in the two groups ($P > 0/05$). Furthermore, the results of paired t -test showed a significant difference in the knowledge score 2 weeks after compared to before the education in both the groups ($P < 0.005$). In addition, the results of independent t -test showed a significant difference in the knowledge score 2 weeks after the intervention in the two groups ($P < 0.005$). The average knowledge score in the workshop group was significantly higher than in noninteractive multimedia learning group.

CONCLUSION: According to the result, new educational techniques such as noninteractive multimedia learning and workshop could improve knowledge of nurses about CVA nursing care in the emergency department.

Keywords:

Education, Iran, knowledge, multimedia, nursing, workshop

Introduction

Stroke is the most common chronic disease in all of the world and the most important known cause for disability and reduction of independency and quality of life in adults.^[1,2] Moreover, its resulting

complications impose huge costs on the health systems of countries and families each year. Many complications of the disease can be prevented and treated if diagnosed early.^[2] The famous phrase "Brain is Time" also confirms the fact that the examination and treatment of acute

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How to cite this article: Dehghan Z, Alimohammadi N, Mohamadirizi S. Comparison of two new educational techniques on knowledge of nurses about cerebrovascular accident nursing care in emergency department. *J Edu Health Promot* 2022;11:60.

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Received: 08-08-2020
Accepted: 19-06-2021
Published: 26-02-2022

stroke should be done urgently and without wasting time and with the coordination of all members of the care team.^[3] Therefore, health-care providers are obliged to provide the patients with specialized and continuous services as soon as they are admitted to the hospital and are hospitalized, and even as they are discharged from the hospital and to minimize mortality and disability in these patients.^[4]

Emergency nurses play a significant role in caring for these patients as they are admitted in the emergency department until they are discharged.^[4] In other words, nurses can have a direct impact on the health and well-being of patients suffering from a stroke, so they should have sufficient knowledge to perform the necessary care, since the emergency department is a high-stress environment with a high workload. Therefore, training and promoting nurses' knowledge, as the first health-care providers in acute and emergency cases especially stroke, is of utmost importance.^[5]

In this regard, Johnson and Bakas in their study point out that nurses play a pivotal role in diagnosing and taking care of patients with stroke and therefore evidence-based therapies must be applied to lower primary delays in the hospitals and its complications and increased survival in these patients is essential.^[4] However, the results of the study of Traynelis revealed that more than half of the nurses in the emergency department did not have enough knowledge about the nurses' diagnoses related to stroke patients. Therefore, if nurses have sufficient knowledge and awareness about their patients' condition and related nursing care and can use standard methods with self-efficacy, its positive effects for these patients will be shown.^[6] In this regard, one of the ways to reach an acceptable level of knowledge in nurses is to use appropriate and dynamic training methods.^[7,8] One of the new methods of education and evaluation that is used for education in many prestigious educational institutions in the world and also in some universities of medical sciences of Iran is multimedia education.^[9]

Multimedia education is a type of individual education in which learners will be able to achieve their educational goals in accordance with their talents and actually they learn how to learn. This is one of the educational goals because learning continues throughout life.^[10,11] In this regard, the increasing availability of appropriate hardware and software for e-learning has set a new horizon for educational institutions. The growing increase in accessing to hardware and software for e-learning has brought a new horizon to educational institutions. It seems that using these facilities for education helps to achieve some of the ideals known as the criteria for the quality of education including:

being learner-centered, lifelong learning, active learning, interacting in learning, and being multimedia.^[12-14]

Another dynamic education method is workshops. Workshop is one of the formal methods of education in which a group of people discuss specific topics and analyze a topic to learn or provide solutions. Another feature of the workshops is that individuals can use the opinions and experiences of experts in the field to find out the answers to their questions and to achieve their goals. In fact, educating in the workshop, like the e-learning method, has disadvantages. This method does not consider individual differences and the learners' needs.^[15]

In general, we should consider the fact that no studies have not been done on the effectiveness of workshop and multimedia education on the knowledge of emergency nurses regarding acute care of patients with cerebrovascular accidents (CVAs). Moreover, no comparative study can be found to introduce the best method. Considering the importance of using appropriate and creative educational methods to train and encourage the individual to learn, this study was aimed to investigate the effect of two new educational techniques such as noninteractive multimedia learning and workshop on knowledge of nurses about CVA nursing care in the emergency department in hospitals affiliated to the Isfahan University of Medical Sciences, Isfahan, Iran. Furthermore, the necessary information in this regard should be announced to the relevant authorities in order to use the most effective educational methods to increase the knowledge of nurses as much as possible.

Materials and Methods

Study design and setting

This experimental study was conducted in 2020 using a two-group design. The study setting was Al-Zahra and Ayatollah Kashani Hospitals affiliated to Isfahan University of Medical Sciences, Isfahan, Iran.

Study participants and sampling

Participants were 64 nurses that worked in the emergency ward randomly selected using a table of random numbers. Participants were assigned to a workshop ($n = 32$) and a noninteractive multimedia learning ($n = 32$) group randomly.

At first, the researcher selected the participants based on inclusion criteria, gave them an informed consent form to sign, and explained the goal of research to them. Then, before any education, demographic and knowledge questionnaires were filled out by the participants in both the groups. The inclusion criteria were agreement to participate in the study, having Bachelor of Nursing

and higher and having at least 6 months of experience in the emergency department, having a phone number to call, and having a computer or /and being able to use them. The exclusion criteria also included not attending the training session for the workshop group and not studying the multimedia content completely for 48 h from the time of delivery.

Data collection tool and technique

Data collection tools consisted of a demographic checklist and knowledge questionnaire. The six items of the demographic questionnaire were age, gender, marital status, education level, emergency work experience, and employment type. The second part, prepared based on the literature and opinions of experts in CVA nursing care, included 23 questions about the care of the patients with CVA. The correct answer was a score of one and the wrong answer was a score of zero. The total scores were 0–23. Furthermore, a score of 12 was considered as the cutoff point. The face validity of knowledge questionnaire was approved by eight nursing experts (content validity ratio = 0.83 and content validity index = 0.81). The reliability of the questionnaire was also confirmed by intraclass correlation coefficient ($r = 0.8$).

For the noninteractive multimedia group, an electronic package was given to them. The electronic package contained CVA nursing care education including text, pictures, animation, and sound, film and slide show about a description of the disease, causes, signs, and symptoms, nursing assessment, nursing diagnoses, and nursing interventions in CVA. After an explanation was given to the nurse as to how to use the electronic package, they were informed that they would be asked some related questions 2 weeks later.

In the workshop group, it was not possible to hold a face-to-face workshop. Therefore, the workshop was held virtually using Skyroom software. After coordinating with participants to participate in the workshop in a certain time of day, first, the Skyroom link of the workshop was sent to the nurses. Hence, the workshop was set up online and interactively. The educational content in both the multimedia and workshop groups, designed by the researcher, was identical. The participants were asked, and 2 weeks later, a knowledge questionnaire was given to them, too, to fill out. The data were analyzed using the independent *t*-test, the paired *t*-test, and the Chi-square test on SPSS version 18.0 (SPSS Inc., Chicago, IL, USA). The level of statistical significance was taken to be 0.05.

Ethical consideration

Ethical aspects of this study were approved by the Nursing and Midwifery Care Research Center (cod: IR.MUI.RESEARCH.REC.1398.753). All of the subjects

were informed about being free to participate in the research and nondisclosure of personal information. They all signed written informed consent.

Results

The results showed that the mean + standard deviation of age and work experience of nurses were $36/4 \pm 8/1$ and $11/3 \pm 6/9$, respectively. Furthermore, most of the nurses were female (96%), married (76%), and with contract employment status (56.9) [Table 1]. Furthermore, the results of independent *t*-test showed that there was no significant difference between the two groups in age, total work experience, emergency work experience, and knowledge score between the two groups before the study ($P > 0.05$) [Table 1]. In other words, the two groups were homogeneous. Furthermore, the results of paired *t*-test showed a significant difference in the knowledge score 2 weeks after compared to before the education in both the groups ($P < 0.005$). In addition, the results of independent *t*-test showed a significant difference in the knowledge score 2 weeks after the intervention in the two groups of workshop and multimedia ($P < 0.005$). The average knowledge score in the workshop group was significantly higher than the multimedia group [Table 2]. Frequency distribution of knowledge score in the two groups before and two weeks after the intervention showed in Table 3.

Discussion

One of the objectives of this study was to determine and compare the average knowledge score before and 2 weeks after the workshop training in nurses. The results showed that in the workshop group, the average knowledge score relating to 2 weeks after the intervention was significantly higher than before. It can be interpreted in such a way that in the workshop training method, the possibility of

Table 1: Between-group comparisons respecting participants' characteristics

Characteristics	Groups, mean±SD or n (%)		P
	Workshop	Noninteractive multimedia	
Age (years)	38.15±0.45	34.00±0.68	0.08 ^a
Work experience (years)	12.50±4.50	10.40±6.10	0.29 ^a
Gender			
Female	31 (96.89)	30 (93.80)	0.55 ^b
Male	1 (3.11)	2 (6.20)	
Type of employment			
Permanent	21 (65.60)	16 (50)	0.14 ^b
Conditional permanent	5 (15.69)	6 (18.71)	
Contractual	6 (18.80)	10 (31.29)	
Education level			
Master's degree	24 (75)	26 (81.30)	0.12 ^a
Bachelor's degree	8 (25)	6 (18.70)	

^aThe results of the independent-sample t-test. ^bThe results of the Chi-square test, SD=Standard deviation

Table 2: Comparison of mean performance score of students for cardiopulmonary resuscitation operation before and after intervention in two groups

Performance	Educational group, mean±SD		t-test results (P, t)
	Noninteractive multimedia	Workshop	
Before intervention	15.03±3.57	15.09±2.30	0.93, -0.80
After intervention	17.03±4.10	19.88±2.60	0.05, -3.93
Paired t-test results (P, t)	0.02, 2.60	0.02, 7.30	

SD=Standard deviation

Table 3: Frequency distribution of knowledge score in the two groups before and two weeks after the intervention

Grops	Knowledge	
	Before, n (%)	After 2 weeks, n (%)
Multimedia		
0-12	3 (9.4)	4 (12.4)
≥ 12	29 (90.6)	29 (87.6)
Workshop		
0-12	0	2 (6.2)
≥ 12	32 (100)	30 (93.8)

teacher–learner interaction is more, and it is also possible to use other methods such as presenting cases, expressing experiences, and questions and answers. In this regard, the results of the study of Yazdannik *et al.*^[13] aiming to compare the two methods of workshop and multimedia training package on nurses in the emergency department showed that workshop training method would increase knowledge score in nurses. In other words, learners solve their educational problems by participating in self-directed learning like a workshop. This method has some advantages such as instructor’s helping the learners to learn the content and encouraging learning, establishing a connection between past and present of learners’ experiences, accelerating the facilitator in obtaining information, and receiving feedback from others. In other words, the workshop encourages active, creative, and thoughtful learning. Moreover, holding a workshop will enhance the development of other skills such as communication skills, effective cooperation in the group, critical reasoning, teaching and learning process, and self-assessment.

Also knowledge before intervention about CVA nursing care was insufficient, which is in line with the results of the study by Traynelis *et al.* (2010). It showed that more than half of the emergency department nurses did not have adequate knowledge regarding the nursing diagnosis for CVA.^[6] Therefore, the purpose of this study was to investigate the effect of two methods of workshop and multimedia training package on nurses’ knowledge.

Another goal of this study was to determine and compare the average score of knowledge before and 2 weeks after multimedia training in nurses. In this regard, the results showed that in the multimedia group, the average

knowledge score 2 weeks after the intervention compared to before the intervention increases significantly ($P < 0.001$). These results are consistent with the results of the study of Karamizadeh *et al.* (2015) aiming to investigate the effect of two methods of multimedia and a workshop on the knowledge of dental learners. Their results showed that the mean score of knowledge in the multimedia group in the posttest was significantly higher than the pretest score ($P < 0.001$).^[16] Hashemiparast *et al.* (2016) conducted a study to determine and compare the effect of two methods of e-learning and lecturing on the knowledge of clinical staff regarding controlling nosocomial infections. The results of their study showed that there was a significant difference between the mean scores of learners’ knowledge before and after training (6.58 ± 1.69 vs. 12.73 ± 2.76) ($P < 0.001$). In general, the above findings indicate that multimedia training has a positive effect on nurses’ knowledge and therefore using this method can be beneficial in nurses’ retraining programs.^[9]

Furthermore, the results showed that there was a significant difference between the two groups after the intervention and therefore the mean score variations in the workshop group were higher than the multimedia training method. Meanwhile, in the study of Yazdannik *et al.*, the mean score variations before and during the training in the multimedia training group were higher compared to the workshop group. This can be attributed to the difference in the method of holding the workshop in the two groups. In Yazdannik’s study, the research units participated in a physical place at a certain time, while in the present study, the workshop was held online, and each unit had the opportunity to participate in this workshop in any place. Many nurses have acknowledged that online workshop has made it possible for them to easily participate in any place, and they were able to participate in the workshop with no worries, since they were not required to have physical presence. However, in the noninteractive multimedia method, the possibility of exchanging opinions, answering questions, and even interacting between the instructor and the learner is so limited and many nurses have constantly talked about these limitations.

Limitations and recommendations

The limitation of the present study was the acquisition of information by participants through other ways such as

books or other sources that could affect the results and could not be controlled. In general, due to the fact that few studies have been conducted in various fields of workshops and noninteractive multimedia in hospitals with the presence of nurses, it is recommended that these methods be performed on variables such as satisfaction and performance. It is also suggested to hold clinical practical workshops and compare them with practical methods.

Conclusion

Nursing education in the workshop method increased the nurses' knowledge. According to the results, using inclusive methods in which there is more instructor-learner interaction can be effective in enhancing the knowledge of health-care providers.

Acknowledgment

The present study was conducted as part of a research project approved and funded by the Isfahan University of Medical Sciences (IR.MUI.RESEARCH.REC.1398.753). We appreciate the cooperation of the university authorities and all the study participants.

Financial support and sponsorship

We are grateful for the financial support provided by the Isfahan University of Medical Sciences.

Conflicts of interest

There are no conflicts of interest.

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