ORIGINAL ARTICLE

Effect of Bioterrorism Management Education on Nurses' Knowledge

MAHNAZ AGHABEIGI[1], HAMID TAGHINEJAD[2], MOSAYEB MOZAFARI[3], *ALI KHORSHIDI*[4]
[1]*Master student of Nursing, Department of medical surgical, School of Nursing and Midwifery, Ilam University of Medical Sciences, Iran. Email: aghabeigi94@yahoo.com*
[2]*Associate Professor, Department of Nursing, School of Nursing and Midwifery, Ilam University of Medical Sciences, Iran, Ilam University of Medical Sciences, Iran*
[3]*Associate Professor, Department of Nursing, School of Nursing and Midwifery, Ilam University of Medical Sciences, Iran.*
[4]*Associate Professor, Department of Epidemiology of medical School, Ilam University of Medical Sciences, Iran.*
Corresponding to Dr. Hamid Taghinejad, Email: taghinejad-h@medilam.ac.ir

ABSTRACT

Background: Bioterrorism is an important challenge for healthcare professionals which has increased worldwide in the last century. Nurses who work as the first respondents in all nursing care units should be trained to be prepared for bioterrorism.
Aim: To determine the effect of bioterrorism management training on the level of Knowledge of nurses in medical and educational hospitals.
Methods: This is a quasi-experimental study that was performed on 92 nurses working in Ilammedical and educational hospitals before and after education. Samples were randomly assigned to two control and intervention groups. The questionnaire assessed the level of Knowledge of nursing staff in the field of bioterrorism. The intervention was done in the form of lectures and pamphlets. one month after the training, the questionnaire was completed again by the participants.
Results: The Knowledge score of nurses of the intervention and control group before training was not significantly different ($p = 0.408$), but after the educational intervention, the group Knowledge score in all five areas of study (the nature and concept of bioterrorism, Causal factors of bioterrorism ($P> 0.000$), Diagnostic factors of bioterrorism ($P<0.000$), Dissemination of biological and bioterrorism factors ($P>0.000$), Elimination of pollution and maintenance of victims of bioterrorism accidents ($P>0.000$) and General Knowledge Nurses ($P<0.000$), were significantly different and the intervention group experienced a greater increase than the control group.
Conclusion: Educational intervention improves and increases nurses' Knowledgein all five areas of bioterrorism. Therefore, bioterrorism preparedness should be considered through continuing education of health care workers, especially nurses.
Keywords: Bioterrorism, Nurses, Education, Knowledge

INTRODUCTION

Bioterrorism covers a wide range of concerns, from catastrophic terrorism with widespread casualties to petty incidents using low-tech but civil unrest, disruption, disease, disability and death[1].The emergence of bioterrorism is an important challenge for public health personnel[2-4], which has increased worldwide in the last century[2]. Bioterrorism, or biological terrorism, is the deliberate spread of pathogenic and deadly biological agents such as microbes, viruses, insects, toxins, as well as radioactive materials and nuclear waste to intimidate people, animals, and plants. A bioterrorism event requires special preparation beyond the usual medical disaster programs .To minimize death and casualties of disasters and emergencies, including bioterrorism, the Asia-Pacific emergency disaster nursing network (APEDNN), has been created to better prepare nurses for effective response to disasters[5]. In such a situation, the medical community must be educated, because nurses do not often see patients who are exposed to biological agents, and a program must be prepared to teach terrorism[(6)]. And according to the 2007 International Police definition, bioterrorism is the release of biological or toxic agents to kill or injure humans, animals, and plants with premeditated intent to intimidate, threaten, and coerce a government or group of people. Practical fulfillment or fulfillment of political or social demands[7,8].

Various studies have shown that infectious agents and toxins, such as measles and smallpox, are more commonly used as biological weapons[9]. During World War I, the Germans used a number of human and animal pathogens. During World War II, the Japanese military used biological agents in the Soviet Union, Mongolia, and China. In late 2001, after the explosion of the Twin Towers of World Trade in the United States, anthrax was dispersed through the United States Postal Union and infected a number of people[10].The World Health Organization estimates that releasing 50 kilograms of sporeantrax along a 2-kilometer line in a population of 500,000 would cause 125,000 infections and 9,500 deaths, compared to other weapons[10]. Although the probability of a biological warfare is low, this possibility cannot be completely ignored, because if it occurs and is not prepared for it, it will cause irreparable damage and losses[11-14]. Disaster preparedness goals include ensuring the readiness of systems, relief protocols, and appropriate resources to provide immediate assistance to victims, thus facilitating relief efforts and rebuilding the services needed. A bioterrorism event requires special preparation and more than just routine medical disaster planning[15]. Hospitals, emergency departments, including physicians and nurses, are the first respondents in relation to patients and have a greater responsibility, with nurses playing an important role in this

regard[16-18]. Nurses work in all nursing care units and must be trained to be prepared for bioterrorism[2]. Studies have shown that nurses have poor knowledge in the face of biological factors[16-19]. The results of a study by Aghaei, et al (2013) showed that most Iranian nurses (96.9%) have little knowledge about bioterrorism[6]. A study in the United States found that most nurses were unprepared to respond[18]. On the other hand, it has been found that trained nurses and physicians were more inclined to treat bioterrorism's patients and victims[6,20,22]. Although studies have shown that educational intervention improves the level of Knowledge and willingness to work and the readiness of nurses to deal with bioterrorist attacks, the level of this Knowledge among Iranian nurses is still very low[23]. At present, there is a gap in the educational curriculum of nursing in relation to the concept of bioterrorism and ways to protect and control it, so the importance of holding training courses in this regard during students' studies seems necessary and can fill this gap to a large extent[24]. The aim of this study was conducted to investigate the effect of bioterrorism management training on the level of Knowledge of nurses in governmental educational hospitals in Ilam.

MATERIAL AND METHODS

This research is a quasi-experimental study before and after that the research community included all official and contracted nurses working in hospitals affiliated to Ilam University of Medical Sciences in 2019. Protocol of the present study was approved by the Research Ethics Committee with IR code. MEDILAM. REC. 1398.030. inclusion criteria for this study were having a bachelor's degree in nursing or higher, having a 5 years' work experience in one of the wards of governmental hospitals in Ilam, no history of any training in bioterrorism and the exclusion criteria were Unwillingness to continue participating in research. The sample required for this study was based on information from previous similar studies[6,23], taking into account the values of first and second errors type (0.05), (0.20), the variance of the mean changes and The size of the intervention was 46; Therefore, the number of people studied in each group was 46 and a total of 92 people.

In this study, the samples were selected as appropriate allocation from hospitals and by simple random method. For this purpose, at the beginning of the study, a list of all eligible nurses was prepared and divided into two groups of intervention and control using the table of random numbers of nurses for data collection, a self-administered questionnaire was used which consisted of two parts: the first part had 8 questions related to demographic characteristics (age, gender, education and work experience), and the second part consisted of 24 questions to measure Knowledge of Bioterrorism includes 5 areas in regard to concept and nature of bioterrorism (4 questions), causal factors of bioterrorism (5 questions), dissemination of biological factors and bioterrorism (3 questions), diagnostic factors of bioterrorism (3 questions) and elimination of pollution and maintenance of bioterrorism accident victims (9 questions) .The range of scores for Knowledge was a minimum of zero and a maximum of 24 (for each correct answer a score of 1 and for each incorrect answer or I don't know a score of zero was given). The score in the field of familiarity with the concept and nature of bioterrorism varied between -0.4. This range was set for causal factors equal to 0.5-0, for the dissemination of biological factors and bioterrorism equal to -0.3, for diagnostic factors equal to 0.3, and for elimination of contamination and maintenance of casualties.

Content validation method was used to determine the scientific validity of the questionnaire. By studying the articles and publications and according to the objectives of the research, the content of the questionnaire was determined with the opinion of 10 faculty members and experts.

In this study, test-retest method was used to determine reliability. Thus, the questionnaire was completed by 15 nursing staff twice at intervals of two weeks and the correlation coefficient between the scores was doubled and calculated, the value of which was estimated to be 0.89 ($p < 0.001$), indicating the appropriate reliability of the questionnaire. And validate the retest. Also, the results of t-test showed that there was no significant difference between the two groups ($p = 0169$, $t = 0.451$). Before starting the training or intervening using the questionnaire, the researcher measured the level of Knowledge of all participants. Then the intervention was performed. Lectures on PowerPoint Lecture, Question and Answer Meeting and Booklet on Bioterrorism Content including (Bioterrorism Concept and Nature), Causal Bioterrorism Factors, Biological Factors and Bioterrorism Publishing, Bioterrorism Diagnostic Factors Was held. The number of training sessions was 5 2-hour sessions with groups of 10-9 people. One month after the intervention, the level of Knowledge of the study groups about bioterrorism was examined again using a designed questionnaire. Medium and standard deviations were used to describe quantitative variables and frequency and percentage were used for qualitative variables. In analytical analysis, T-pair, independent t-test, Mann-Whitney, Wilcoxon, Lon and Smirnov tests were used and the significance level of the tests was considered to be less than 0.05. Spss21 software was used to analyze the data.

RESULTS

In this study, 92 nursing staff (46 people in the intervention group and 46 people in the control group) was examined. 45% (n = 41) of the participants in the study were male and 55% (n = 51) were female. The number of male nurses in the intervention and control group was 20% and 25%, respectively, and the number of female nurses in the intervention and control group was 30% and 25%, respectively. P), work experiences (P = 0.338) and age (P = 0.981) did not differ significantly (Table 1).

Before training, there were no significant difference between The level of study group's Knowledge in terms of the nature and concept of bioterrorism (P = 0.115), causal factors of bioterrorism (P = 0.673), diagnostic factors of bioterrorism (P = 0.051), dissemination of biological factors and bioterrorism (p = 0.051) P) . In relation to the level of Knowledge about the elimination of pollution and maintenance of the injured in bioterrorism accidents (P =

0.0950) and the level of general Knowledge of groups (P <0.408), independent t-test was used, which did not differ significantly before training (Tables 2 and 3).The level of Knowledge of groups in terms of the nature and concept of bioterrorism (P> 0.000), causal factors of bioterrorism (P> 0.000), diagnostic factors of bioterrorism (P> 0.000), dissemination of biological factors and bioterrorism (P> 0.000) Elimination of pollution and maintenance of bioterrorism casualties (P>0.000), the general Knowledge of nurses (P<0.000) after training were significantly different from each other and the knowledge of intervention group in all areas increased more than the control group (Table 2). In the intragroup comparison, the results of the Wilcoxon test also showed that there was a significant difference between before and after training in the intervention group in terms of the nature and concept of bioterrorism (P>0.000), causal factors of bioterrorism (P>0.000), diagnostic factors of bioterrorism (P>0.000), the spread of biological agents and bioterrorism (P>0.000), the elimination of pollution and the maintenance of the victims of bioterrorism accidents (P>0.000) (Table 4).

Regarding the general Knowledge of nurses, the use of T-pair test showed that there is a significant difference between before and after training in the intervention group (P<0.000) (Table 5).In the intragroup comparison, the results of the Wilcoxon test also showed that there was a significant difference between before and after training in the control group in terms of the nature and concept of bioterrorism (P<0.06), causal factors of bioterrorism (P=0.948), diagnostic factors of bioterrorism. (P=0.251) but there is no significant difference between the level of Knowledge of the spread of biological factors and bioterrorism before and after training in the intervention group. In the elimination of contamination and maintenance of bioterrorism casualties, the T-pair test was used, which was a significant difference (P=0.01), but the Knowledge of the intervention group was higher. In general, there was no significant difference between before and after training in the control group (P=0.846).

DISCUSSION

Due to the fact that in the event of bioterrorism attacks, hospitals and medical centers are the first place to refer and treat patients, so the readiness and Knowledge of medical staff, especially nurses, is of great importance. Therefore, it is necessary to measure the level of Knowledge of nurses and study the ways that will increase their level of Knowledge in the field of bioterrorism.

In the present study, the level of Knowledge of nurses before and after training in both control and intervention groups was evaluated and the results showed that the level of Knowledge of nurses before and after training in the intervention group had a statistically significant difference and increased Knowledge. However, in the control group, there was no difference between the mean scores before and after the training. According to the findings, training has improved nurses' Knowledge in terms of the nature and concept of bioterrorism, causal factors, dissemination factors, diagnostic factors and maintenance of casualties in bioterrorism accidents.In terms of the nature and concept of bioterrorism, the results of this finding are consistent with the results of Herold et al. (2003)[25]. In their study, 237 physicians from the US-based Alachua Department of Bioterrorism found that 74.2 percent of respondents had never received any training in bioterrorism, and only 25.8 percent had received training before. 90% of respondents who had not previously received any training in bioterrorism were unwilling to help the victims of bioterrorism. In contrast, 68% of physicians who have previously undergone bioterrorism training have a tendency to treat the victims of bioterrorism. In terms of causal factors, the results are consistent with the findings of Moshtaghe Eshgh, et al[25]. They conducted a study entitled "The effect of education on the level of Knowledge and attitude of nurses working in hospitals affiliated to Mazandaran Medical Sciences in Sari in relation to bioterrorism"[23]. The findings showed that the majority of units (96%) had poor knowledge about bioterrorism and its causal factors (0.33-3% of 100%) and the majority of them had indifferent attitude towards bioterrorism (96.9%) (score of 33.6-46% from 100%). they concluded that the level of Knowledge of nurses in this study was very low due to the causes of bioterrorism.

In terms of the dissemination of biological factors and bioterrorism, the results of this finding were almost consistent with the findings of Zarghani et al. [(26)]. In one study, they looked at "bioterrorism and its impact on citizen security." This descriptive-analytical study, based on reliable sources, examines the biological factors that may be used by terrorists, as well, the most important ways to transmit these factors and the impact of bioterrorism attacks on the security and health of citizens. The findings suggest that bioterrorism poses a greater risk to terrorists than any other type of terrorism because of the attractiveness of biological materials to terrorists.

In relation to the field of diagnostic factors of bioterrorism, the results of this finding are in line with the results of Hamzehpour et al[23]. They conducted a study entitled the role of educational intervention on the level of Knowledge and attitude in the field of bioterrorism. The results showed that there was no significant difference in the Knowledge score of male and female students before the educational intervention. However, after the educational intervention, the score of women's Knowledge increased significantly in all four areas of the nature of bioterrorism, diagnostic factors, causal factors and management of bioterrorism accidents while these changes were not in men. The conclusion is that educational intervention improved the level of Knowledge in the nature of bioterrorism, its causal factors, diagnostic methods and management in bioterrorism events among female students. However, the low level of Knowledge and preference of students indicates the need for more training in this area.

In terms of pollution elimination and maintenance of bioterrorism accident victims, the results of this finding are consistent with the results of Moshtaghe Eshgh and colleague's study[(27)]. The study units (87.7%) had poor Knowledge before the training, and after the training, the majority of them (93.8%) had good knowledge. Also, based on the findings of the study, the difference in Knowledge score was significant in terms of elimination of infection and maintenance of bioterrorism victims before and after

training. The results of the present study showed that although before the training, the level of Knowledge of the groups was not significantly different from each other, but their level of Knowledge after training was significantly different and the intervention group experienced more increase in this level than the control group. In terms of level of Knowledge, there was a significant difference between before and after the training of the intervention group, while there was no significant difference in the control group. The results of this finding are consistent with the results of Maryam Aghamohammadi et al.[24].They studied bioterrorism training in nursing students through workshops and textbooks.

The results of the study showed that the mean of post-training Knowledge scores in the two groups were different and significantly the mean scores in the intervention group were higher than the control group. While before the training, there was no significant difference between the two groups. Despite that education has increased the Knowledge of nurses, this category needs specialized attention and training. One of the suggested ways is to include biologic topics in the curriculum and curriculum of undergraduate and advanced nursing courses during the student period, so that some of the educational gaps in this regard may be compensated. Also, holding domestic and international workshops, seminars and conferences is another solution that can be effective in creating interest and desire of health and medical staff, especially nurses, in the field of familiarity with bioterrorist issues [23]. the limitations of this study is that it has been performed only on nurses working in hospitals affiliated to Ilam University of Medical Sciences, and the generalizability of its results to other treatment groups, regions and cities should be done with caution.

CONCLUSION

The findings show that educational intervention improves the level of Knowledge of nurses in the areas of nature and understanding of bioterrorism, its causal factors, ways of dissemination, diagnostic methods and pollution elimination of bioterrorism casualties among nurses. However, the low level of Knowledge and willingness of nurses indicates the need for further training in this area.

Acknowledgments: We grace and pleasure, We sincerely thank all nurses and staff in the Hosoital within Ilam University of Medical Sciences for their cooperation in requiring data for this particular project.

Table 1. Demographic characteristics of the study participants

Variable		Intrevention		Control		p(value)	
		Frequency	Percent	Frequency	Percent	Frequency	
Gender	Man	18	20	23	25	41	0.294
	Female	28	30	23	25	51	
Education	Bacheler	41	45	44	44	85	0.238
	Masters	5	5	2	2	7	
Work experience	5 to 10 years	16	17	23	25	39	0.388
	11 to 15 years	19	21	12	13	31	
	16 to 20 years	7	7.6	6	6.5	13	
	More than 21 years	4	4.5	5	5.5	9	
Age	25 to 30 years	3	3	4	4	7	0.981
	31 to 35 years	22	24	22	24	44	
	36 to 40 years	14	15.2	13	14	27	
	More than 41 years	7	7.6	7	7.6	14	

Table 2. Comparison between groups before and after training (Yuman Whitney test)

Variable		mean± standarddeviation		Mann-Whitney U	P Value
		intervention	Control		
The nature and concept of bioterrorism	Pre-test	0.82±1.76	0.72±1.50	872.5	0.115
	Post-test	0.46±3.72	1.10±1.76	153.5	0.000<
Causal factors of bioterrorism	Pre-test	1.17±2.20	1.07±2.09	1006.0	0.673
	Post-test	0.49±4.74	1.05±2.08	25.5	0.000<
Diagnostic factors of bioterrorism	Pre-test	0.78±1.54	0.78±0.72	989.0	0.051
	Post-test	0.44±2.74	0.86±0.96	282.0	0.000<
Dissemination of biological agents and bioterrorism	Pre-test	0.68±0.98	0.69±0.72	832.0	0.51
	Post-test	0.53±2.37	0.94±0.98	258.5	0.000<
Knowledge of pollution prevention and maintenance of bioterrorism accident victims	Pre-test	0.62±8.46	1.81±5.11	91.5	0.000<
Total score of Knowledge	Post-test	1.22±22.02	3.69±11.46	69.24	0.000<

Table 3. Comparison between groups before training (independent t-test)

Variable		mean± standard deviation		P Value
		intervention	Control	
Knowledge of pollution prevention and maintenance of bioterrorism accident victims	Pre-test	1.76±5.52	1.54±5.54	0.950
Total score of Knowledge	Pre-test	2.64±12.00	3.11±11.50	0.408

Table 4: The results of the Wilcoxon follow-up test for intragroup comparison

Variable		P Value
The nature and concept of bioterrorism	intervention	0.000<
	Control	0.069
Causal factors of bioterrorism	intervention	0.000<
	Control	0.948
Diagnostic factors of bioterrorism	intervention	0.000<
	Control	0.251
Dissemination of biological agents and bioterrorism	intervention	0.000<
	Control	0.033
Knowledge of pollution prevention and maintenance of bioterrorism accident victims	intervention	0.000<

Table 5. T-pair test results for intragroup comparison

Variable		**P Value**
Knowledge of pollution prevention and maintenance of bioterrorism accident victims	intervention	0.011
Total score of Knowledge	Control	0.000<

REFERENCES

1. Sridevi V, Vikram Simha B, Gayathri Naidu S, Chowdary K, Yaragani A, Sree y. Awareness on Bioterrorism among qualified dentists in a teaching dental institution in southern India. Journal of Dr NTR University of Health Sciences. 2020;9(1):32-36.
2. Ebadi A, Yousefi S, Khaghanizade M, Saeid Y. Assessment competency of nurses in biological incidents. Trauma Monthly. 2015;20(4).
3. Grochtdreis T, de Jong N, Harenberg N, Görres S, Schröder-Bäck P. Nurses' roles, knowledge and experience in national disaster pre-paredness and emergency response: A literature review. South Eastern European Journal of Public Health (SEEJPH). 2016.
4. Patel R, Wattamwar K, Kanduri J, Nahass M, Yoon J, Oh J, Shukla P, Lacy CR. Health care student knowledge and willingness to work in infectious disease outbreaks. Disaster medicine and public health preparedness. 2017;11(6):694-700.
5. Aghaei N, Seyedin H, Sanaeinasab H. Strategies for disaster risk reduction education: A systematic review. Journal of education and health promotion. 2018;7.
6. Aghaei N, Nesami MB. Bioterrorism education effect on knowledge and attitudes of nurses. Journal of emergencies, trauma, and shock. 2013;6(2):78.
7. Tierney BC, Martin SW, Franzke LH, Marano N, Reissman DB, Louchart RD, Goff JA, Rosenstein NE, Sever JL, McNeil MM. Serious adverse events among participants in the Centers for Disease Control and Prevention's Anthrax Vaccine and Antimicrobial Availability Program for persons at risk for bioterrorism-related inhalational anthrax. Clinical Infectious Diseases. 2003;37(7):905-911.
8. Saberinia A, Alinezhad A, Jafari F, Soltany S, Sigari RA. Oncogenic miRNAs and target therapies in colorectal cancer. Clinica Chimica Acta. 2020.
9. Khosravi M. Bioterrorism via Water and Food. Yafteh. 2017;19(3):1-11.
10. Riedel S, editor Biological warfare and bioterrorism: a historical review. Baylor University Medical Center Proceedings; 2004: Taylor & Francis.
11. Moghadam SAB. Knowledge and attitude of iranian red crescent society volunteers in dealing with bioterrorist attacks. Emergency. 2016;4(1):16.
12. van Courtland Moon JE. Pathogens for War: Biological Weapons, Canadian Life Scientists, and North America Biodefence. JSTOR; 2014.
13. Soltany S, Alavy Toussy J, Gholamaliyan E. Effect of vitamin B6 on mastalgia: A double blind clinical trial. Koomesh. 2016;17(4):950-956.
14. Soltany S. A rare coexistence of retrorectal and ovarian cysts: A case report. Iranian Red Crescent Medical Journal. 2016;18(9).
15. Usher K, Mills J, West C, Casella E, Dorji P, Guo A, Koy V, Pego G, Phanpaseuth S, Phouthavong O. Cross-sectional survey of the disaster preparedness of nurses across the A sia–P acific region. Nursing & health sciences. 2015;17(4):434-443.
16. Bork CE, Rega PP. An assessment of nurses' knowledge of botulism. Public Health Nursing. 2012;29(2):168-174.
17. Jacobson HE, Soto Mas F, Hsu CE, Turley JP, Miller J, Kim M. Self-assessed emergency readiness and training needs of nurses in rural Texas. Public Health Nursing. 2010;27(1):41-48.
18. Rebmann T, Mohr LB. Bioterrorism knowledge and educational participation of nurses in Missouri. The Journal of Continuing Education in Nursing. 2010;41(2):67-76.
19. Soltany S. Postoperative peritoneal adhesion: an update on physiopathology and novel traditional herbal and modern medical therapeutics. Naunyn-Schmiedeberg's Archives of Pharmacology. 2020:1-20.
20. Bhoopathi V, Mashabi SO, Scott TE, Mascarenhas AK. Dental professionals' knowledge and perceived need for education in bioterrorism preparedness. Journal of dental education. 2010;74(12):1319-1326.
21. Rokach A, Cohen R, Shapira N, Einav S, Mandibura A, Bar-Dayan Y. Preparedness for anthrax attack: the effect of knowledge on the willingness to treat patients. Disasters. 2010;34(3):637-643.
22. Ghods K, Soltany S, Toussy JA, Ghorbani R, Arab D, Ardestani-Zadeh A, Hemmati H. Meatal stenosis following circumcision with Plastibell device and conventional dissection Surgery; a prospective investigation. Journal of Renal Injury Prevention. 2017;7(2):84-88.
23. Pour SH, Khajehnasiri N. Effect of Education on Knowledge and Attitude Regarding Bioterrorism. Iranian Journal of Emergency medicine. 2015;2(2):76-81.
24. Aghamohammadi M, Barzegar M, Tayebi Arasteh f, MOLAVI Vardanjani M. The effect of bioterrorism education through holding a workshop and offering a manual on the knowledge of nursing students. IRANIAN JOURNAL OF EMERGENCY CARE (IJEC). 2017;1(3 #r00481):-.
25. Herold J, Peavy J. Bioterrorism: A Survey Assessing the Level of Awareness among Alachua County's Physicians. Oxford, UK: Oxford University Press; 2002.
26. Zarghani SH, Nasimi Z, Kharazmi Oa. Bioterrorism and its impact on the security of citizens. Journal of Urban Social Geography. 2018;5(2):17-30.
27. Moshtaghe eshgh Z., Hosseini S. M. J., Alavi majd H., Aghaee N. Evaluation of education effects on prevention and treatment of bioterrorism on knowledge and attitude of nurses of Mazandaran medical university. Journal of Military Medicine. 2008;9(4):295-30