Original Article

Access this article online

Quick Response Code:

Website: www.jehp.net

DOI: 10.4103/jehp.jehp_404_21

Comparison of the effect of bioterrorism education through two methods of lecture and booklet on the knowledge and attitude of nurses of Shams Al-Shomus Nezaja Hospital

Masoud Khoshnudi, Fahime Ghadamgahi[1], Gholamreza Najjarzade[1], Farzane Habibi Mud[1], Nahid Aghaei[2,3], No'man Arab[4], Seyyed-Javad Hosseini-Shokouh[5], Atabak Nikbakht[6]

Research Unit of Shams Al-Shomus Nezaja Hospital, Mashhad University of Medical Sciences, Mashhad, Iran, [1]Research Unit of Shams Al-Shomus Nezaja Hospital, Health Administration of Iran Army Ground Forces, Tehran, Iran, [2]Department of Health in Disaster and Emergency, School of Health Management and Information Sciences, International Campus Iran University of Medical Sciences, Tehran, Iran, [3]Nasibeh Nursing and Midwifery School, Mazandaran University of Medical Sciences, Sari, Iran, [4]Research Unit of Shams Al-Shomus Nezaja Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran, [5]Infectious Disease Research Canter, Faculty of Medicine, Aja University of Medical Science, Tehran, Iran, [6]Mazandaran University of Medical Sciences, Sari, Iran

Address for correspondence:
Masoud Khoshnudi, Research Unit of Shams Al-Shomus Nezaja Hospital, Mashhad University of Medical Sciences, Mashhad, Iran.
E-mail: masoudkhoshnud@gmail.com

Received: 28-03-2021
Accepted: 16-11-2021
Published: 30-06-2022

Abstract:

BACKGROUND: Today, considering the importance of bioterrorism, it may be time to assess the risk of bioterrorism as an important priority. Nurses, as the broadest group of therapy group, are very influential in this regard.General aim: To determine the impact of bioterrorism education through two methods of lectures and booklets on the knowledge and attitude of nursing staff. Practical Aim: Minimizing the damage caused by bioterrorism attacks by empowering nursing staff.

MATERIALS AND METHODS: This two-group semiexperimental intervention study was performed as a before and after education intervention with the participation of 80 nursing staff of Shams Al-Shomus Nezaja Hospital affiliated to Health Administration of Islamic Republic of Iran Army Ground Forces. The study population included all hospital nursing staff in 2021. The inclusion criteria included having a willingness and informed consent to participate in the study and exclusion criteria included unwillingness to continue cooperation and failure to complete more than 10% of the questionnaire by the subject. This study was performed on 77 nurses in 2021. The nurses were divided into two groups: lecture and booklet. First, the pretest was completed by the nurses. After the educational intervention, both groups completed the posttest. Both groups then completed the questionnaire again after about 2 weeks. First, all the data were measured for normal distribution by the Kolmogorov–Smirnoff test. Statistical description was expressed for the variables with normal distribution as the ratio of geometric mean ± standard error and for abnormal variables as mean ± standard error. To compare the means of the studied quantitative variables, t-test and Wilcoxon matched-paired statistical tests were used. The significance level was considered <0.05. SPSS.16 and Graph Pad Prism 8.0.1 softwares were used to analyze the statistical data.

RESULTS: Using both methods is effective in improving the level of knowledge and betterment attitude, but according to the paired t-test in comparison of the two groups, at intervals immediately after training and 2 weeks after training, a significant increase in the average knowledge score of the lecture group Statistically shows ($P < 0.001$). However, the analysis of attitude scores was performed between the two groups of lectures and booklets, which did not show statistically significant changes between them.

CONCLUSIONS: One of the most important issues in the performance of medical staff in bioterrorism attacks is useful, effective, correct, and sufficient training. According to the results of the present study,bioterrorism training leads to increasing the level of knowledge and betterment the attitude of nurses in the field of bioterrorism. Therefore, the inclusion of training courses in medical centers, especially military medical centers, is necessary and sensitive.

Keywords:

Attitude, bioterrorism, booklet, education, knowledge, lecture, nurses

How to cite this article: Khoshnudi M, Ghadamgahi F, Najjarzade G, Mud FH, Aghaei N, Arab N, *et al*. Comparison of the effect of bioterrorism education through two methods of lecture and booklet on the knowledge and attitude of nurses of Shams Al-Shomus Nezaja Hospital. J Edu Health Promot 2022;11:192.

Introduction

The bioterrorism means the abuse of microorganisms, including viruses, bacteria, parasitic and fungal agents, and microbial toxins to intimidate or destroy humans and animals, and to destroy plants with the aim of killing, damaging, intimidating, and threatening.[1-3] Considering the importance of bioterrorism, it may be time to assess the risk of bioterrorism and biological weapons as an important priority and to better understand the historical development and use of biological agents.[4] Bioterrorism enables humans to take the advantage of microorganisms with the utmost planning, precision and speed. However, there is no doubt that this powerful tool can benefit or harm human, depending on which individuals and groups they belong to.[5] According to reports, the American Biological Warfare Research Center initially estimated the cost at $ 350,000 in 1944 and then at $ 460,000 for biological weapons research for field tests of bombs and microbial weapons.[6] Assess of these results shows that the mountain of bioterrorism is a security threat and has targeted one of the most important components of national security, namely the protection of people's lives.[7] In case of bioterrorist attack event or a face to face biological warfare, irreparable damage to the health and medical foundation of the country.[8]

In the first stage, hospitals, emergencies and health professionals, including physicians and nurses, are the first responders to patients[6] who must have an acceptable level of knowledge, awareness, attitude, and preparedness in the face of bioterrorism. However, according to reports, the level of awareness of professionals has not been assessed favorable.[9] For example, in the Rebmann study, it was found that 72.5% of the nurses had poor knowledge in this field.[10] In Iran, Bahraini Moghaddam study showed that 78.3% of the volunteers had no knowledge about facing and managing bioterrorist accidents and only 1.7% had complete and good knowledge.[3] Similarly, Aghaei and Nesami in 2013 showed that most Iranian nurses (96.9%) had weak knowledge in the field of bioterrorism.[11] According to researches, nurses' knowledge and attitudes toward treating patients, awareness of the dangers of bioterrorism, and participation in preparedness for bioterrorism have not been evaluated favorable.[12] Therefore, preparing for a biological attacks is essential for emergency services and health-care workers and also requires more attention and research. Limited knowledge and poor preparedness of health-care providers about bioterrorism and lack of attention to medical staff training can have irreversible consequences in future.[11,13,14]

At present, most medical institutions in the world are looking for educational methods that lead to improving clinical decision-making power and continuous and self-centered learning of learners. In nursing education, the relationship between education and nursing services is constantly growing. In the implementation of educational programs, choosing the right educational method is one of the most important steps in the design of education because an effective learning, above all, is the result of good a teaching.[15] Among the reasons for choosing two educational methods, we can mention the conventional method of lecture and educational booklet, its low cost, tangibility, and also considering that in previous studies, just one educational method was usually used.[16] Therefore, the present study was conducted to compare the effect of bioterrorism education through two methods of lecture and booklets on the knowledge and attitude of the nursing staff.

Subjects and Methods

Design

This two-group semiexperimental intervention study was performed as a before and after education intervention with the participation of 80 nursing staff of Shams Al-Shomus Nezaja Hospital affiliated to Health Administration of Islamic Republic of Iran Army Ground Forces. The study population included all hospital nursing staff in 2021. The inclusion criteria included having a willingness and informed consent to participate in the study and exclusion criteria included unwillingness to continue cooperation and failure to complete more than 10% of the questionnaire by the subject.

Sampling

The number of sample volume was calculated using (G Power is a tool to compute statistical power analyses for many different t tests, F tests, $\chi 2$ tests, z tests and some exact tests. G Power can also be used to compute effect sizes and to display graphically the results of power analyses.) considering the error of the first type α = 0.05 and the study power of 90%, and the number of 36 participants for this study was estimated to be a total of 40 considering the sample loss by available sampling method. Furthermore, the allocation of samples was simple random. For this purpose, at the beginning of the study, a list of all qualified nurses was prepared and then nurses with using a table of random numbers divided into two test groups (lecture and educational booklet).

Research tools

Data collection tools in this study include two parts: (1) Demographic information questionnaire including: age, gender, field of study, level of education, work experience, in-service department, and in-service position. (2) Standard questionnaire for measuring the knowledge and attitude of bioterrorism prepared

by Moshtagh *et al.*;[17] To define the validity of the questionnaire, content quality assessment with the help of eight experts was used to determine reliability, and the Split-half method of Cronbach's coefficient alpha was also employed.[9] In the present study, Cronbach's coefficient alpha was 0.78 and was found to be suitable. This method was performed to test both knowledge and attitude. The questionnaire was prepared in two parts and 36 questions. The first part consisted of 26 questions to assess the level of knowledge about bioterrorism, which had five areas: the concept and essence of bioterrorism, agents causing bioterrorism, release of bioterrorism agents, diagnosis of bioterrorism, bioterrorism detection and pollution removal and care of bioterrorism victims. To answer each question by choosing the (correct), (wrong) and (I do not know) options was that each true answer was given 1 score and the false answer or (I do not know) was given a 0score. Thus, the minimum score in the knowledge section was 0 and the maximum score was 26. Finally, the total score answers of the knowledge section were classified into poor, moderate, and good knowledge, so that all the raw scores of the knowledge section were graded based on zero to one hundred, and based on this conversion, scores from 0% to 33.3% were in the poor knowledge group, scores of 4.4 33% to 66.6% were in the medium knowledge group and 66.7% to 100% scores were in the good knowledge group. The second part of the questionnaire included 10 news phrase related to measuring attitude. In this part, the score for each phrase was done using the Likert scale and the zero to four grading criteria. Hence, the minimum score was 0 and the maximum score was 40. In this section, all the obtained values were converted into percentages and the scores were placed in three rows of negative attitude, indifferent and positive attitude. In this way, scores of 0 to 33.3% were placed in the negative attitude group, scores of 33.4% to 66.6% were placed in the group of indifferent attitude and scores of 66.7% to 100% were placed in the positive attitude group.[9,11] First, the pre-test questionnaire was completed by nurses. Then, the lecture intervention group participated in the training class (2 class session of 3 h in two consecutive days) and after participating in the training class, completed the posttest questionnaire. Regarding the education booklet intervention method, the booklet was first delivered to the participants, and after 2 days, they completed the posttest questionnaire. Then, after about 2 weeks, both groups completed the questionnaire again to evaluate the durability of the training.

Data analysis

First, all data were measured for normal distribution by the Kolmogorov – Smirnoff test. Statistical description was expressed for the variables with normal distribution as the ratio of geometric mean ± standard error and for abnormal variables as mean ± standard error. To compare the means of the studied quantitative variables, *t*-test and Wilcoxon matched-paired statistical tests were used. The significance level was considered < 0.05. . (SPSS 16.0 is a comprehensive system for analyzing data. SPSS can take data from almost any type of file and use them to generate tabulated reports, charts, and plots of distributions and trends, descriptive statistics, and complex statistical analyses and also GraphPad Prism is a commercial scientific 2D graphing and statistics software for Windows and Mac OS desktop computers. Software features include nonlinear regression, with functionalities including the removal of outliers, comparisons of models, comparisons of curves, and interpolation of standard curves).

Ethical statements

This study has been approved by the Ethics Committee of AJAUMS with code: IR.AJAUMS.REC1400.091.

Results

In this study, 80 nursing staff were investigated. Three of the samples were excluded from the study and the information related to 77 nurses was finally analyzed. Thirty-eight samples were assigned to the lecture group and 39 samples assigned to the textbook group. According to the findings, the mean age of the participants was 33.2 ± 6.6 in the range of 22 to 51 years. Furthermore, the relationship between demographic variables and the scores of knowledge and attitude were investigated and it was found that there was no statistically significant relationship between age, gender, field of study, level of education, work experience, in-service department and in-service position with the scores of knowledge and attitude and data were homogeneous in terms of dispersion. Table 1 shows some of the demographic information of the participants in the study.

As shown in Table 2, the comparison of the mean scores of the knowledge before, after and two weeks after the training, using the ANOVA test in the lecture group shows a significant difference ($P < 0.001$).

Furthermore, two-by-two comparisons of the mean knowledge scores in the time periods before, after and two weeks after the training were performed using the least significant difference (LSD). It was found that there is only a significant difference between the average knowledge scores in before and after training ($P < 0.001$). However, in other comparisons, there was no significant difference between the mean scores of knowledge.

Furthermore, one-way ANOVA test in the lecture group showed a significant difference between the mean

scores of knowledge of the studied units in before, after and after 2 weeks of training (P = 0.02). Two-by-two comparisons of the mean knowledge scores in the before, after and 2 weeks after training showed that there is only a significant difference between the average knowledge scores in the before and after training stages (P = 0.02).

In order to assess the educational effectiveness of the two groups, knowledge scores were analyzed using paired *t*-test between the two groups of lecture and booklets. The changes in scores between two groups in before and two weeks after the training showed a statistically significant (P < 0.001). However, no significant changes were seen between two groups in the pretraining period. Figure 1 shows the course of change in the average knowledge score in two groups and three time periods.

According to Table 3, the comparison of the mean scores of attitude before training, immediately after training and two weeks after training of the studied units using the ANOVA test of repeated measures in the groups of lecture and booklet showed a significant difference, respectively (P = 0.004) and (P = 0.003). Furthermore, two-by-two comparisons of mean attitude scores in the time periods before, after and two weeks after training were performed using LSD and there was a statistically significant difference between the mean scores of attitude in before and after training (P < 0.001). There was no significant difference in the mean of attitude scores in other comparisons. Furthermore, in two-by-two comparisons of mean attitudes scores in the booklet group between the three time periods, a significant difference was observed between before and immediately after training (P = 0.002). Analysis of attitude scores using the paired *t*-test between the two groups were conducted which did not show statistically significant changes between the two groups. Figure 2 shows the course of change in the mean scores of attitude in the two groups and three time periods.

Table 1: Demographic information of the research units

Variable	Percent
Gender	
Male	22.2
Female	78.8
Nursing	75
Field of study	
OR technician	5.6
Anesthesia technician	5.6
Midwifery	7.3
Medical emergency	2.8
Practical nurse	2.8
Level of education	
MSc	11.1
BSc	83.3
Associate	5.6
Work experience	
<5 years	19.4
Between 5 and 10 years	5.6
Between 10 and 15 years	27.8
More than 15 years	47.2

OR=Operating room

Table 2: Comparison of average knowledge scores before training, immediately after training, and 2 weeks after training

	One-way ANOVA test of repeated measures	And 2 weeks after training	Immediately after training	Before training
Lecture	<0.001	1.2±22.24	1.3±23.76	2.84±17.12
Booklet	0.02	1.87±18.79	1.72±19.11	1.97±17.47
Paired *t*-test		<0.001	<0.001	0.66

Discussion

Considering of bioterrorist attacks, hospitals are the first place for patients and injured people to refer; therefore, the knowledge and attitude of medical staff, especially nurses, which are the largest group of treatment and the quality of their services is directly related to the effectiveness of health services, which ultimately affects the health of patients, is very important.[18,19] In the present study, the level of knowledge and type of attitude of nursing staff before and after training and two weeks after training were assessed in two intervention groups. The scores before training were the same in the two groups and there was no statistically significant difference, but after the educational intervention, the mean scores of knowledge and attitude increased in both groups. The difference was that in the lecture group there was a greater increase than the booklet group and this difference was also statistically significant (P < 0.05). Due to that demographic variables may be different between two groups and this difference may affect the results of statistical tests, using statistical tests, the difference between demographic data in the two groups was

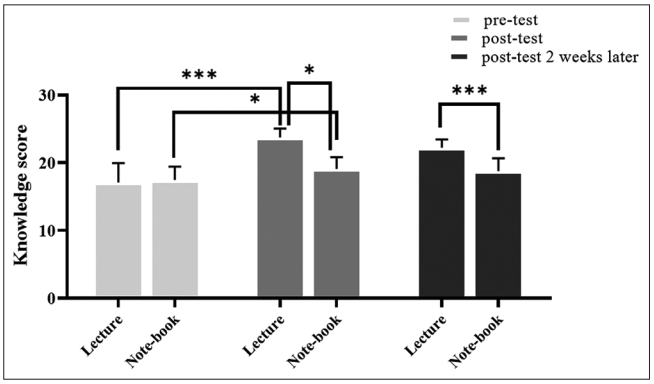

Figure 1: The course of change in the average knowledge scores in two groups and three time periods

Table 3: Comparison of average attitude scores before training, immediately after training, and 2 weeks after training

Before training	Before training	One-way ANOVA test of repeated measures	And 2 weeks after training	Immediately after training
Lecture	0.004	4.40±29	4.41±29.88	2.95±25.35
Booklet	0.003	3.81±26.84	2.43±28.53	3.36±24.68
Paired *t*-test		0.10	0.25	0.53

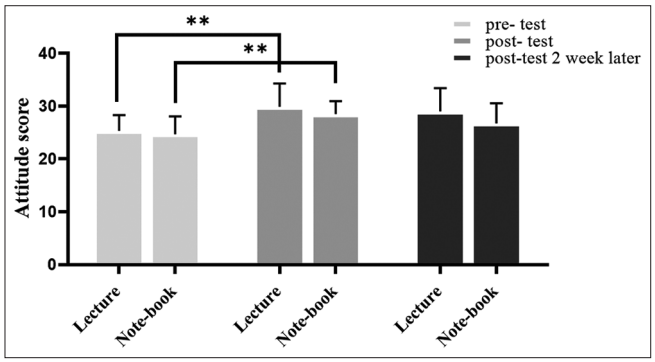

Figure 2: The course of change in the average attitude scores in two groups and three time periods

investigate and it was found that there is no statistically different and two groups are homogeneous in terms of demographic data.

Consistent with the findings of the present study, Sharififar *et al*. in a study found that two methods of lecturing and simulation have a statistically significant positive effect on nursing students' knowledge ($P < 0.001$). However, there was no significant difference between the findings of the two educational methods.[20] Furthermore, Aghaei and Nesami in a study entitled "The effect of education on nurses' knowledge and attitudes in bioterrorism" in 2013 in a statistical population of 65 nurses in hospitals of Mazandaran University of Medical Sciences found that almost all research units were weak in bioterrorism before training. They are also indifferent in terms of attitude; but after training, all of them got a good score in terms of knowledge and were in a positive group in terms of attitude. In their study, researchers used the lecture method for teaching.[11] Furthermore, Aghamohammadi *et al*. in a study on nursing students in 2017 concluded that teaching in both workshop methods and educational booklets has a beneficial effect on the knowledge of the participants.[16] Moshtaq and Aghaei in a similar study concluded that the knowledge and attitude of nurses after training have improved through lecturing too.[17] In a methodologically similar study that was conducted to determine the effect of bioterrorism training through two methods of lectures and educational booklets on the knowledge and attitude of health workers in Iranshahr hospitals in 2010, researchers found both methods have a positive effect on average staff awareness. However, this effect in the lecture group was more.[21] Aghabigi *et al*. in a study entitled "Effect of Bioterrorism Management Education on Nurses" in 2020, which was conducted on 92 nurses, found the level of nurses' knowledge in five main areas of bioterrorism (the concept and essence of bioterrorism, agents causing bioterrorism, release of bioterrorism agents, diagnosis of bioterrorism, bioterrorism detection and pollution removal and care of bioterrorism victims) significantly increased after the educational intervention.[22] Furthermore, in 2018, a cross-sectional study was conducted by Georgia *et al*. on 240 nurses of Mazandaran University of Medical Sciences entitled "An Assessment of Knowledge and Attitude of Iranian Nurses toward Bioterrorism." According to the findings, 91.7% of the samples had poor knowledge and 93.3% did not had a specific opinion on bioterrorism (had an inappropriate attitude) toward bioterrorism. Researchers in this study considered bioterrorism education is necessary for nursing students and even graduate nurses.[9]

Inconsistent with the present study, Hamzehpour in 2015 in a study entitled "Effect of Education on Knowledge and Attitude Regarding Bioterrorism" found awareness in the nature and essence of bioterrorism, agents causing bioterrorism, accident management and bioterrorism detection in female students as compared to male students has been more before intervention. The reason for this difference with the present study may be related to the incorrect allocation of samples and differences in the statistical population; also his study was conducted with the participation of life sciences students, but the mentioned studies were performed on nursing students ore nurses working in hospitals.[8]

Rebmann in 2010 in a study on identifying risk factors for bioterrorism in USA, entitled "Bioterrorism knowledge and educational participation of nurses in Missouri" found that many nurses' knowledge of bioterrorism was low and a main obstacle to education has been the lack of sufficient cognition of the status of education and suggested bioterrorism education should be taught through continuing education and curriculum of nursing schools.[10] Manu Sharma conducted a study in 2019 at selected medical universities in New York with the aim of improving the level of bioterrorism knowledge of nursing students and designing a pilot curriculum and found out after the training session for 4 h, awareness of nursing students significantly increased. Students were also asked about the positive impact of the training session, all of them firmly acknowledged that the training has a beneficial effect on their level of knowledge in the field of bioterrorism and will have a significant impact on their patient care process in bioterrorism attacks. This study proposes to include bioterrorism educational content in the curriculum of nursing students too.[23] Atakro

et al. also conducted a study in Ghana in 2018 entitled "Nurses' and Medical Officers' Knowledge, Attitude, and Preparedness toward Potential Bioterrorism Attacks" in 2018. According to the results, the level of attitude of both groups was equal, but it is noteworthy point that it was found that the level of knowledge of hospital staff is better than nurses working in hospitals. Hospital staff seems to be more interested in following bioterrorism news than nurses. Both groups also acknowledged the need for a bioterrorism training program for all hospital staff. Researchers considered it is necessary to plan for the inclusion of bioterrorism educational content in the curriculum of nursing schools.[24]

Conclusions

According to the results of our study, bioterrorism education leads to increasing the level of knowledge and improving the attitude of nurses. It can be a guideline for administrators of the Ministry of Health and Medicine and Education for planning to achieve the goals of preventive and defence against bioterrorism, especially in military nurses. Therefore, the inclusion of educational programs in the form of seminars, conferences, and workshops for students and staff of the department of health seems necessary.

Limitations and suggestions

According to the prevalence of coronavirus, education classes were held in accordance with hygienic protocols. The limitations of the present study include small number of samples, short time of educational sessions, absence of nursing students in the study, contact of two educational groups, and possibility of studying bioterrorism topics from other sources. Therefore, it is suggested that other studies with more sessions and higher sample size be performed in other research groups such as nursing, medical and laboratory science students, and also using other educational methods.

Acknowledgment

This article is result of a research project that approved by the AJAUMS. The authors thank research deputy and officials of the Shams Al-Shomus Nezaja Hospital and all the diligent nurses who have helped us to perform this study as well as possible.

Financial support and sponsorship

This study funded by Research Deputy of Health Administration of Iran Army Ground Forces.

Conflict of interest

There are no conflicts of interest.

References

1. Bidaki MZ, Balalimood M. Bioterrorism and biological warfare, from past to the present: A classic review. J Birjand Univ Med Sci 2015;22:182-98.
2. Mottaghi A, Kaviani RM, Najafi S. The correlation between environmental security and national security (case study of bioterrorism). Majlis Rahbord 2015;22:75-100.
3. Moghadam SA. Knowledge and attitude of iranian red crescent society volunteers in dealing with bioterrorist attacks. Emergency 2016;4:16-20.
4. Moshiri M, Etemad L, Balali-Mood M. The biowarfare agent ricin. Biological toxins and bioterrorism. Toxinology 2015;1:43-59.
5. Oliveira M, Mason-Buck G, Ballard D, Branicki W, Amorim A. Biowarfare, bioterrorism and biocrime: A historical overview on microbial harmful applications. Forensic Sci Int 2020;314:110366.
6. Barras V, Greub G. History of biological warfare and bioterrorism. Clin Microbiol Infect 2014;20:497-502.
7. Reza Es. Biological threats of the american occupation of the quds regime and providing an appropriate solution to these threats in Iran. Mil Sci Tact 2019;15:77-100.
8. Siyavash HP. Surveying knowledge and performance of basij medical community members of West Azerbaijan in response to the biological events in 2016-2017: A short report. J Rafsanjan Univ Med Sci 2019;17:975-84.
9. Gorji HA, Niknam N, Aghaei N, Yaghoubi T. An assessment of knowledge and attitude of iranian nurses towards bioterrorism. Iran Red Crescent Med J 2017;19:1-5.
10. Rebmann T, Mohr LB. Bioterrorism knowledge and educational participation of nurses in Missouri. J Contin Educ Nurs 2010;41:67-76.
11. Aghaei N, Nesami MB. Bioterrorism education effect on knowledge and attitudes of nurses. J Emerg Trauma Shock 2013;6:78-82.
12. Grimes DE, Mendias EP. Nurses' intentions to respond to bioterrorism and other infectious disease emergencies. Nurs Outlook 2010;58:10-6.
13. Ebadi A, Yousefi S, Khaghanizade M, Saeid Y. Assessment competency of nurses in biological incidents. Trauma Mon 2015;20:e25607.
14. Patel R, Wattamwar K, Kanduri J, Nahass M, Yoon J, Oh J, *et al*. Health care student knowledge and willingness to work in infectious disease outbreaks. Disaster Med Public Health Prep 2017;11:694-700.
15. Hutchinson SW, Haynes S, Parker P, Dennis B, McLin C, Welldaregay W. Implementing a multidisciplinary disaster simulation for undergraduate nursing students. Nurs Educ Perspect 2011;32:240-3.
16. Aghamohammadi M, Barzegar M, Molavi VM. The effect of bioterrorism education through holding a workshop and offering a manual on the knowledge of nursing students. Iran J Emerg Care 2017;1:66-73.
17. Moshtagh Z, Aghaee N, Alavi H. Evaluation of education effects on prevention and treatment of bioterrorism on knowledge and attitude of nurses of Mazandaran medical university. J Mil Med 2008;9:295-301.
18. Khoshnudi M, Safari A, Parvaz NN. Quality of life and demographic characteristics in nurses of hospitals of Kashmar in 2018: Cross sectional study. J Nurs Educ 2019;7:59-66.
19. Khoshnudi M, Safari A, Vahedian-Shahroodi M, Sadeghnejhad H, Parvaz NN. The Relationship between Health Literacy and Quality of Life in Nurses of hospitals of Kashmar in 2018. J Health Literacy 2019;4:9-17.
20. Ebadi M, Sharififar S, Zareiyan A. Comparison of the effects of conventional and simulation teaching methods on nursing students' knowledge in personal protection in chemical attacks. EBNESINA 2014;15:17-23.
21. Pejmankhah S, Pejmankhah S, Mirhaghi A. Effect of bioterrorism training through lecture and educational pamphlet on knowledge

of medical staff in hospitals of Iranshahr, Iran in 2010. Health Syst Res 2012;8:1255-62.

22. Aghabeigi M, Taghinejad H, Mozafari M, Khorshidi A Effect of bioterrorism management education on nurses' knowledge. Pak J Med Health Sci 2020;14:1550-1554.
23. Sharma M, Dixon JK, Carter EJ, McCorkle R. Essential evidence-based introductory bioterrorism content for practicing nurses. Nurse Educ Pract 2019;34:104-10.
24. Atakro CA, Addo SB, Aboagye JS, Blay AA, Amoa-Gyarteng KG, Menlah A, *et al*. Nurses' and medical officers' knowledge, attitude, and preparedness toward potential bioterrorism attacks. SAGE Open Nurs 2019;5:2377960819844378.