



## **Factors Affecting the Competency of Nursing Students Regarding Bioterrorism**

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### **Dear Editor-in-Chief**

"Bioterrorism is an intentional act of spreading of biological agents, such as viruses, bacteria, toxins, and fungi that cause diseases or death to humans, animals, or plants"(1). The major biological agents covered by the Centers for Disease Control and Prevention are toxic infectious agents, such as anthrax, smallpox, botulinus, viral hemorrhagic fevers, and tularemia (1). Conducting bioterrorism is less expensive than conducting nuclear or chemical terrorism; bioterrorism agents can be easily mass-produced, purchased, and transported, and their prevention is difficult and requires follow-up measures. In addition, the source of infections and the route of transmission are difficult to trace, and this leads to strong infectiousness and high mortality rates (2). Thus, an unsuitable systematic response at the level of a national disaster medical system can lead to very harmful damages.

South Korea is internationally classified as the area with the highest threat of chemical, biological, nuclear, radiological, and high-yield explosive weapons (3). Thus, systemic preparation for potential bioterrorism at the national level is required. The most central resources for establishing a national disaster medical system are healthcare institutions and healthcare workers. Nurses are the largest group of healthcare work-

ers and play an essential role in bioterrorism responses as they are the closest contact points to victims (4). Hence, strengthening the competency of nurses to respond to bioterrorism is crucial. However, they have little experience with patient exposure to biological agents, and therefore, the degree of recognition is low (5). In a survey of university professors who teach health-related majors, 97.6% said that they had no experience in educating students on bioterrorism (5). This revealed that education and intervention to strengthen competency regarding bioterrorism for nursing students should be improved. However, few studies on bioterrorism awareness and competencies for nursing students exist. The present study explored the factors that affect the competency of nursing students regarding bioterrorism to evaluate the basis for developing bioterrorism-related education and skill-building programs for them.

The participants in this study were 428 students who were at least sophomores in a college in Korea. Data were collected from Oct 23, 2019, to Nov 29, 2019, and the participants were asked to complete a self-reporting questionnaire on their knowledge, attitudes, and competency to deal with bioterrorism. To identify the factors that influence the participant's competency



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to deal with bioterrorism, multiple linear regression analysis was conducted.

Competency regarding bioterrorism was significantly correlated with attitudes toward bioterrorism ( $r = .48, P < .001$ ). Knowledge of bioterrorism had no significant correlation with competency and attitudes toward bioterrorism. Regression analysis showed that the predictive factors that affect competency regarding bioterror-

ism were attitude toward bioterrorism ( $\beta = 0.45$ ), knowledge ( $\beta = -0.09$ ), grade ( $\beta = 0.11$ ), satisfaction with the major ( $\beta = 0.10$ ), and previous experience with bioterrorism education ( $\beta = 0.10$ ). Attitude toward bioterrorism was found to have the greatest influence on competency regarding bioterrorism, and the explanatory power of all variables that explain competency regarding bioterrorism was 25.8% (Table 1).

**Table 1:** Factors that Influence Competency Regarding Bioterrorism ( $N = 428$ )

Variables	B	SE	$\beta$	t	P
(Constant)	1.28	0.25	-	5.18	<.001
Attitudes regarding bioterrorism	0.27	0.03	.45	10.54	<.001
Grade	0.14	0.05	.11	2.59	.010
Major satisfaction	0.13	0.05	.10	2.35	.019
Previous experience with bioterrorism education†	0.25	0.11	.10	2.34	.020
Knowledge regarding bioterrorism	-0.06	0.03	-.09	-2.25	.025

$R^2 = 26.7$ , Adjusted  $R^2 = 25.8$ , F = 30.76,  $P < .001$

†Dummy variable (No = 0, Yes = 1)

The present study was conducted to determine the knowledge, attitudes, and competency of nursing students regarding bioterrorism. Factors that influence competency regarding bioterrorism were attitudes, knowledge, grade, satisfaction with their major, and previous experience with bioterrorism education. Therefore, an undergraduate curriculum on bioterrorism should be systematically established so that nursing students can obtain an accurate knowledge of bioterrorism and attitude and competency to actively respond to it.

## Conflicts of interest

The authors declare that there is no conflict of interest.

## Acknowledgements

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