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Experiences in Teaching and Learning

## Effects of Ebola Virus Disease education on student health professionals

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## ABSTRACT

**Background and purpose:** Ebola Virus Disease (EVD) is a severe, often fatal illness. Studies have shown that healthcare professionals lack an in-depth knowledge of EVD. Countries in Europe, Asia, and Africa are beginning to emphasize the need to train healthcare professionals about EVD, but the United States still lacks formal training for healthcare students. There is little research about the effectiveness of EVD training to support this study. The purpose of this study was to examine the knowledge-base and attitudes of healthcare students concerning EVD.

**Educational activity and setting:** Two-hundred sixty-nine participants (including pharmacy students, physician assistant students, and nursing students) completed a pre- and post-survey. The survey measured both knowledge and perceptions. The post-survey was administered after the intervention to measure change. The intervention was comprised of a pre-recorded lecture about EVD transmission, prevention, and treatment.

**Findings:** All groups displayed significant changes in knowledge and perception, specifically in the areas of EVD transmission, prevention, and treatment. Pharmacy students' attitudes increased significantly over their baseline score for all three attitude questions, whereas there were no significant changes in attitude to EVD among nurses. Physician assistant students' attitudes changed regarding the topic of isolation.

**Discussion:** Education on EVD in pharmacy schools may provide beneficial results for students' knowledge, and it may also help schools provide evidence to meet current standards for accreditation.

**Summary:** This educational intervention represents an effective format that could be a useful tool to help enhance or augment knowledge for healthcare workers. This could lead to better care for patients.

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## Background and purpose

Ebola Virus Disease (EVD), also known as Ebola Hemorrhagic Fever or simply Ebola, is a fatal disease. Ebola virus outbreaks are found sporadically in many African countries.<sup>1</sup> EVD is transmitted through direct contact with blood or bodily fluids, contaminated objects, or infected animals. EVD symptoms can appear anywhere from 2 to 21 days after exposure to EVD and include fever, muscle pain, diarrhea, vomiting, and unexplained hemorrhage.<sup>1</sup> There is no current vaccine for EVD, and standard treatment includes providing intravenous fluids and supportive care.<sup>1</sup> The case fatality average rate of EVD is approximately 50%.<sup>2</sup> Community awareness of prevention and control techniques is critical in preventing outbreaks and the spread of the disease.<sup>2</sup>

In 2014, an outbreak of EVD in West Africa generated concern that it might expand into a pandemic.<sup>1</sup> Videos shown in the news coverage, coupled with the growing influence of social media images, led to concerns about EVD in the United States.<sup>3</sup> The Ebola-related news coverage incited thousands of internet searches and tweets, that appeared to amplify panic.<sup>4</sup> This panic put a strain on many healthcare facilities and healthcare workers as they took on the added burden of educating patients and community members about a disease they knew very little about.<sup>5</sup> This strain, along with limited supplies and inadequate training, led to several EVD infections of healthcare professionals.<sup>5</sup> Due to their lack of training and preparation, many healthcare professionals expressed negative attitudes and perceptions regarding working with EVD patients.<sup>5</sup>

The recent EVD concern in the United States led to an interest in providing more effective EVD education for healthcare professionals, many of whom may have little or no understanding of EVD causes, treatment, and safety precautions.<sup>6</sup> In a pilot study by Sodano et al.<sup>7</sup> in Rome, only 32.9% of respondents had an acceptable level of EVD knowledge. The participants who had received prior training about EVD scored significantly higher than the participants with no prior training.<sup>7</sup> In another study, emergency department staff supported EVD-based training and felt that they were better prepared for a potential EVD outbreak because of the educational intervention they had received.<sup>8</sup>

Less than 60% of college students in a school of public health in Iran had correctly responded to questions about EVD symptoms and populations at the most risk for EVD.<sup>9</sup> This provides a challenge and opportunity for colleges offering degrees in health professions to provide education on EVD. Additional opportunities for interprofessional education could be potentially rewarding for many students in the health professions.

Outside the United States, greater emphasis has been placed on EVD training because governments have allocated funds and specified training regarding EVD prevention and treatment.<sup>10</sup> This was demonstrated by one study in the Ivory Coast.<sup>10</sup> Many resources have been allocated to increase the preparedness and education of individuals to better equip themselves to prevent ongoing outbreaks of EVD.

Educational interventions have been used to help increase the knowledge of healthcare topics in both students and healthcare professionals.<sup>11,12</sup> One form of educational intervention is a recorded lecture. Students like recorded lectures because they have been shown to enhance learning and increase engagement with the material.<sup>12</sup> However, data is limited with regards to how well recorded lectures will enhance or engage learning specifically about EVD.

There is also limited information on how an educational intervention about EVD can influence students' perceptions and knowledge. The objective of this study was to provide guidance on the practical education of EVD to help improve the knowledge and attitudes of healthcare professionals as well as to assess the effects EVD education could have on the knowledge of healthcare professions students.

## Educational activity and setting

### Design

Due to the design and scope of this study, it was granted exempt status by the Shenandoah University IRB committee. The study consisted of a cross-sectional survey and a training intervention. The survey was administered pre- and post-intervention to measure the effect of training on the participant's knowledge and perception of EVD. A total of 550 students (390 pharmacy students, 110 nursing students, 50 physician assistant students) were eligible to complete the pre- and post-survey. The participants completed the pre-survey and then were provided a pre-recorded educational presentation on EVD transmission and treatment. The slide-based educational intervention lasted approximately ten minutes and was presented via E-mail so that students of different disciplines could all view the material at the same time. The intervention covered major content areas including background/history of EVD, diagnosis, symptoms, transmission, prevention, treatment, and travel precautions. Once the video finished playing, the survey redirected the students to the post-test. This survey was completed outside of the classroom during students' available time over the course of one month.

A survey was developed similar to the one developed by Akram et al.<sup>13</sup> and Arief et al.<sup>14</sup>. The same survey instrument was used for the pre- and post-survey (Appendix A). The survey took approximately 20–25 min to complete and consisted of 47 questions in a web-based survey tool. There were five main sections in the survey, including basic demographics and questions related to EVD transmission, prevention, treatment, and perceptions/attitudes. The survey assessed knowledge of EVD through 10 transmission questions, 16 prevention questions, and eight treatment questions. For these knowledge questions, participants were provided three choices (yes/true, no/false, or unsure). True-false questions were used to increase the efficiency of the reader and because of the dichotomous nature of the questions.<sup>15</sup> Some questions were worded in the negative so that not all questions had a "yes" answer. Students' attitude toward EVD was measured by three attitude statements. These three items used a 5-point Likert scale (1 = strongly agree; 5 = strongly disagree). A single question was used to determine students' source of information about EVD. Demographics

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