

Brief Communication

Evaluation of bleeding control course for health-care providers in Japan

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Aim: The Bleeding Control Basic (BCon) course was developed by the American College of Surgeons to teach laypeople and health-care providers (HCPs) how to stop life-threatening bleeding. The first BCon course in Japan was held for HCPs in July 2018. Our study aimed to evaluate the utility of the course, the satisfaction and confidence level of the HCPs that participated, and their experience with using vascular tourniquets.

Method: The BCon participants were asked to complete a survey after the BCon courses from December 2018 to December 2019. These participants included different types of HCPs (physicians, nurses, and emergency medical technicians). After the course, the participants were asked to evaluate: (i) the perceived utility of the course, (ii) their satisfaction with the course, (iii) their confidence in the techniques that they learned in the course, (iv) their experience of using tourniquets in eight specific areas using a 10-point Likert scale.

Results: A total of 163 HCPs, including 108 physicians, 27 nurses, and 28 emergency medical technicians completed the BCon course. The respondents rated the course highly, showing an average value of approximately 9 for each item for perceived utility, satisfaction, confidence, and experience in using tourniquets. In particular, nurses rated the overall activity more highly than physicians ($P < 0.05$).

Conclusion: The BCon course and tourniquets were well-received by all types of HCPs in Japan.

Key words: Bleeding control course, education, health-care provider, survey, tourniquet

INTRODUCTION

ACCORDING TO THE World Health Organization, traumatic injuries are responsible for over 5 million deaths worldwide each year.¹ Hemorrhage is a leading cause of death in those patients.² In the United States, the Hartford Consensus established a framework for minimizing deaths

due to mass shootings, specifically eliminating preventable deaths due to limb exsanguination.³ One of the goals of the Hartford Consensus was to increase the education of lay rescuers in the management of patients with traumatic hemorrhage.³ Several recent mass casualty incidents, including the Boston Marathon bombing, Pulse nightclub shooting, and a mass shooting at a music festival in Las Vegas, have demonstrated the need for on-scene hemorrhage control to reduce preventable deaths during mass casualty incidents.^{4,5} Learning how to control bleeding in the field is important for citizen first responders and health-care providers (HCPs) who encounter victims with active bleeding due to trauma.² The Bleeding Control Basic (BCon) course, which was launched in 2017 by the American College of Surgeons (ACS), has been spreading worldwide.⁶ In Japan, no courses focused on

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bleeding control skills for laypeople and HCPs; therefore, the first BCon course was run for HCPs in July 2018. In this course, trainees receive hands-on training by trained instructors on appropriate tourniquet application and proper dressing use for hemorrhage control.⁶

Although several studies have reported the efficacy of the BCon course and the utility of tourniquets, most studies were from the United States.^{7,8} Gunshot wounds are rarely seen in Japan due to strict gun control. Thus, it is uncommon for Japanese citizens and HCPs to encounter situations that require temporary hemorrhage control at the scene. In addition, most Japanese are not familiar with using vascular tourniquets. Therefore, it seemed unlikely that Japanese citizens would use tourniquets in the absence of HCPs. Thus, our study aimed to evaluate the utility of the course, the satisfaction and confidence levels of HCPs, and their experience in using tourniquets after completing the BCon course.

METHODS

HEALTH-CARE provider participants in BCon courses from December 2018 to December 2019 were included in this study. These included different types of HCPs (physicians, nurses, and emergency medical technicians [EMTs]). Each BCon course consisted of two sections: a 30-min lecture and 30 min of skills/practice, including wound packing, wound compression, and Combat Application Tourniquet application. The training was provided in Japanese using the official Bleeding Control Basic English slideshow presentation.⁹ At each training session, the lecture was given by ACS certified BCon instructors. After the course, the participants were asked to evaluate: (i) the perceived utility and their satisfaction (question [Q1]–5), (ii) their confidence in the techniques (Q8) that they learned in the course (Q6 and Q7), (iii) experiences in using tourniquets in eight specific areas using a 10-point Likert scale. The questions on the survey are provided in Appendix S1. Categorical data were reported as the number and percentage. Tukey's all pairs comparison was used to evaluate the course activity among physicians, nurses, and EMTs using Prism 8 (GraphPad Software, San Diego, CA, USA). *P*-values of <0.05 were considered statistically significant.

RESULTS

DURING THE STUDY period, a total of 163 participants (108 physicians, 27 nurses, and 28 EMTs) from 12 BCon courses were included (Fig. 1). The response rate of the questionnaire was 100%. The post-course survey results regarding its utility and the satisfaction and confidence levels among HCPs showed that they rated the BCon

course highly, with average scores for each question of approximately 9, which indicated strong agreement or a high degree of confidence. The score of nurses for Q2 (lecture content of the course) was significantly higher than that for EMTs ($P < 0.05$). The score of nurses for Q3 (hands-on training segment of the course) was significantly higher than those for physicians and EMTs ($P < 0.05$). In addition, their scores for Q5 (overall activity) regarding the satisfaction were significantly higher than those of physicians ($P < 0.05$). The scores for Q1, Q4, Q6, and Q7 were not significantly different among physicians, nurses, and EMTs (Table 1). The utility of the Combat Application Tourniquet for Q8 was evaluated highly (physicians, nurses, and EMTs), with a score of approximately 8, indicating its use was easy to learn (Fig. 2A,B).

DISCUSSION

THE ACS CERTI field BCon program has trained over 1 million people in 71 countries worldwide to date.⁶ Several studies have reported the efficacy of the BCon course in the USA^{9,10} and other countries.^{9,11–13} In Spain, it was reported that the BCon course was evaluated as good for relevance, usefulness, applicability, and satisfaction by most of the studied population.¹³ In India, the vast majority of participants said that they had a high degree of confidence in their wound packing and tourniquet skills.¹³ In Colombia, the skills of the participants were increased after the BCon

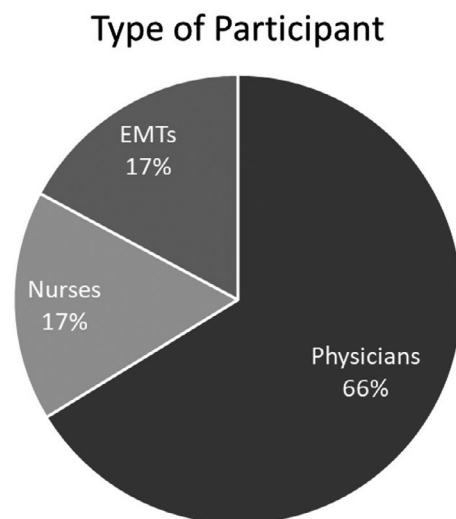


Fig. 1. During the study period, 12 Bleeding Control Basic courses were taught in Japan to 163 participants, including 108 physicians, 27 nurses, and 28 emergency medical technicians (EMTs).

Table 1. Survey of the post-course utility and satisfaction (Q1–Q5) and skills confidence (Q6, Q7) among health-care providers in Japan who participated in a bleeding control course

Type of participant	Overall	Physicians	Nurses	EMTs	P-value
Assessment of post-course utility and satisfaction					
Q1. The knowledge acquired during the course would be useful in the care of patients with severe bleeding.	8.89 (1.50)	8.73 (1.67)	9.40 (0.97)	9.00 (1.05)	NS
Q2. I feel the lecture content of the course adequate for training.	8.89 (1.51)	8.79 (1.60)	9.63 (0.63)	8.57 (1.53)	<0.05
Q3. I feel the hands-on training segment of the course adequate for training.	8.60 (1.94)	8.46 (1.85)	9.51 (2.50)	8.2 (1.32)	NS
Q4. I would recommend this course to other colleagues or friends.	9.08 (1.48)	8.99 (1.61)	9.48 (1.00)	9.04 (1.20)	NS
Q5. Overall, how would you rate this educational activity?	9.01 (1.46)	8.87 (1.62)	9.72 (0.61)	8.88 (1.15)	<0.05
Assessment of post-course confidence					
Q6. I am confident with providing bleeding control by using tourniquets to aid patients with severe extremity bleeding with the knowledge acquired in the course.	8.61 (1.56)	8.59 (1.68)	8.56 (1.31)	8.71 (1.30)	NS
Q7. I am willing to provide bleeding control using the techniques and principles learned to aid or provide first aid care to patients with severe extremity bleeding.	9.38 (1.16)	9.31 (1.28)	9.52 (0.82)	9.5 (0.88)	NS

Responders used a 10-point Likert scale, with 1 indicating strong disagreement or very little confidence and 10 indicating strong agreement or a high degree of confidence. Data are shown as mean (standard deviation). P-values of <0.05 were considered to indicate statistical significance. EMT, emergency medical technician; NS, not significant.

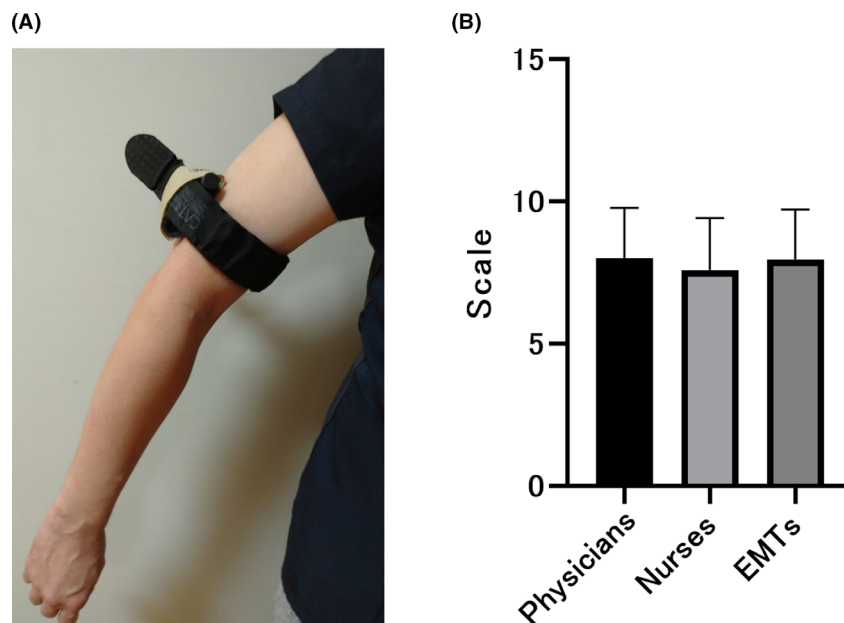


Fig. 2. A, Application of the Combat Application Tourniquet (CAT) during the Bleeding Control Basic course. B, In the post-course survey, the CAT technique (Q8) was evaluated by health-care professionals using a 10-point Likert scale, with 1 indicating very difficult and 10 indicating very easy. The mean \pm standard deviation is shown. EMT, emergency medical technician.

campaign.¹⁴ In Italy, the BCon program was very well received by military and police personnel. In addition, civilian health professionals and medical students rated the program highly.¹⁴

In Japan, there are few opportunities for HCPs to treat patients with gunshot wounds. The National Police Agency reported that there were only 22 shooting crimes (excluding accidents and suicides) throughout Japan in 2017. Three people were killed by gun-related violence in Japan in 2017. In contrast, according to the Gun Violence Archive, a US-based survey group that collects information on gun violence, there were 15,612 gun-related deaths in the USA in 2017.^{15,16}

Other prehospital trauma courses are available in Japan. The Japan Prehospital Trauma Evaluation Course¹⁷ is a prehospital trauma education course that was developed in Japan. However, this course is not focused on bleeding control skills. In contrast, the BCon course is focused on helping citizens and HCPs learn to control bleeding using a tourniquet and gauze.

Health-care professionals who participated in the BCon course highly rated it, showing an average value of approximately 9 for each item concerning the utility of the course, their satisfaction with the course, their confidence in performing the skills learned during the course, and their experiences in using tourniquets, suggesting that the BCon course and use of tourniquets were very well received, as it has been in other countries. In the current study, it was noteworthy that nurses rated the utility of the course and their satisfaction with the lecture content and hands-on training higher than EMTs. Japanese nurses have less opportunity to receive such trauma education in comparison with EMTs. In addition, nurses rated the overall activity higher than physicians. Japanese nurses might be more interested in the knowledge and techniques taught by this course than physicians. The BCon course for HCPs, especially nurses, is thus considered to be an important course to take when learning to care for injured patients in the prehospital setting in Japan.

The present study was associated with several limitations. The study cohort was relatively small. We were unable to undertake a pre-course survey to clarify the educational effect by comparing such findings with the post-course survey results. Despite these limitations, this is the first study in Japan to describe the perceived utility of the BCon course and the satisfaction and confidence levels of participants.

CONCLUSIONS

THE BCON COURSE and training regarding the use of vascular tourniquets were well received by all types of

HCPs in Japan. We hope that equipping HCPs with essential knowledge and skills for bleeding control will reduce preventable deaths.

DISCLOSURES

Approval of the research protocol: The Institutional Review Board at Tokyo Medical and Dental University provided approval (M2019-096).

Informed consent: Based on the opt-out approach, we disclosed information about this study and excluded data when the patient declined to participate directly or via proxy.

Registry and registration no. of the study/trial: N/A.

Animal studies: N/A.

Conflict of interest: The authors declare no conflict of interest.

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SUPPORTING INFORMATION

Additional Supporting Information may be found in the online version of this article at the publisher's web-site:

Appendix S1. Questions on the post-course survey.