ATHLETIC TRAINING EDUCATION JOURNAL

www.nataej.org
ISSN: 1947-380X

COLUMN:
EDUCATION LITERATURE

Current Literature Summary

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Continuing education is mandatory to maintain BOC certification; however, there is a void in athletic training research regarding its efficacy in maintaining or enhancing professional competence. Presumably, one acquires new knowledge by attending continuing education programs. Hopefully this new knowledge is retained and translated into professional practice to improve patient care. Other health care professions, particularly nursing and medicine, have examined the efficacy of continuing education. We will provide brief synopses of current continuing education research and discuss possible applications to athletic training.

Zahner SJ, Tipple SM, Rather ML, Schendzielos C. Supporting nurse preceptors through online continuing education. *J Contin Educ Nurs*. 2009;40(10):468-74.

Reviewed by David Berry, Saginaw Valley State University

Summary of research context and methods: Community health nurses play a significant role in student learning and professional socialization, serving as nurse preceptors. Nurse preceptors engaging in on-site supervision and clinical instruction of undergraduate nursing students require adequate preparation and ongoing training to ensure appropriate levels of interaction; however, the preparation for the preceptor role by nursing programs appears to be challenged. The purpose of this study was to pilot the feasibility of using an adapted online continuing education course to increase knowledge and self-efficacy in nurse preceptors who work with student nurses in the acute and primary care settings. A one-group pre- and post-test repeated measures design was utilized. A pre-course electronic survey included demographic questions, one knowledge question (time 1) from each of the courses nine module quizzes, and a preceptor self-efficacy assessment instrument. Preceptors then completed nine self-paced online course modules examining a variety of educational topics affecting nurse preceptors in acute, primary and long-term health care settings. A four-item quiz was administered at the conclusion of each module, with one question repeated from the pre-course survey. Responses to the repeated questions became the post course assessment of knowledge gain (time 2). A course satisfaction assessment was administered after the completion of the nine modules. An invitation to complete a follow-up survey, including the previously used nine knowledge questions (time 3) and the same self-efficacy assessment instrument was sent out to participants at a later date.

Summary of research findings: Thirteen female participants (age = 47.92 [7.6] years practicing as a nurse = 20.77 [10.1]) completed all nine module quizzes and follow-up surveys. On average the modules took participants 34.62 minutes to complete with most of the modules completed on the participant's personal time. Knowledge gains between pre-test (time 1) and post-test (time 2) was statistically significant, as was between time 1 and time 3 (post-test). No statistically significant difference was noted between time 2 and time 3. The self-efficiency assessment instrument demonstrated good reliability (Chronbach's alpha=.938), however, no statistically significant difference in nurse preceptor self-efficacy was noted between the pre-test (time 1) and post-test (time 3). All but one participant agreed that the length of time to complete the course was acceptable and would be useful while all participants agreed or strongly agreed that the course was easy to access and was enjoyable.

Implications for athletic training education/research: The role of the nurse preceptor appears to parallel that of the approved clinical instructor (ACI) in athletic training. Concurrently, nursing programs, like athletic training programs, struggle with designing and implementing meaningful programming that prepares nurses for the preceptor role. Zahner et al suggest that the online continuing education program designed specifically for their target population was a feasible method for preceptor education; however, this appears to be only in the short term. The decline in participant knowledge between time 2 and time 3 suggests that the initial information learned was not completely retained though the reasons why are inconclusive; however, probable reasons may include lack of relevance to clinical practice, lack of accountability for not retaining knowledge, length of time between trials (approximately a 6 month average), and a small sample size. The literature does demonstrate that frequent refresher courses

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Full Citation:
Doherty-Restrepo J. Education literature: Current literature summary. *Athl Train Educ J*; 2010;5(4):190-192.

for cardiopulmonary resuscitation skills resulted in significantly shorter times to achieve proficient skills and when learners are encouraged to apply new knowledge to practice, the likelihood of becoming more proficient increases. Thus, the question one needs to ask is, "Could an online continuing education program for ACIs offered every 3-6 months with relevance to their role as an ACI improve knowledge retention and the ACI's ability to provide quality educational experiences?"

The methods by which an academic program addresses the CAATE standards for ACI training is obviously left to the discretion of each individual institution. However, a consistent online continuing education model to support the best practices of teaching and learning offered on a bi- or semiannual basis could be useful to improve ACI knowledge of and application of teaching and learning strategies in the clinical setting. When combined with athletic training program-specific online continuing education programming, practitioners wishing to serve as an ACI for multiple programs would no longer need to complete full training programs for each institution. Further research is needed to determine if this type of online educational programming would be feasible in athletic training education and whether this type of program would support ACIs and help to assure that athletic training education programs are providing quality educational experiences.

Alemagno SA, Guten SM, Warthman S, Young E, Mackay DS. Online learning to improve hand hygiene knowledge and compliance among health care workers. *J Contin Educ Nurs.* 2010;41(10):463-71.

Reviewed by Phil Hossler, East Brunswick High School

Summary of research context and methods: It has been reported that only 30-60% of health care workers comply with the Centers for Disease Control (CDC) and Prevention's established hand hygiene guidelines. Given that approximately 30% of hospital illnesses and deaths can be attributed to insufficient hand hygiene practices, it is paramount that current hand hygiene practices be assessed and resultant educational and behavioral reforms determined. This study assessed the effects of an online continuing education program on 256 health care worker's knowledge of hand hygiene guidelines and self-assessed behavioral changes in hand hygiene practices.

Summary of research findings: The online continuing education program resulted in significant improvement in hand hygiene knowledge and self-assessed practice. One area that showed the greatest improvement was knowledge of the effectiveness of alcohol-based hand sanitizers in reducing the spread of pathogenic bacteria on the hands. The fact that health care workers practice good hand hygiene less than 50% of the time is another area of notable knowledge improvement resulting from the online continuing education program. Ninety-seven percent of the participants implemented better hand hygiene practices following the online program.

Implications for athletic training education/research:
Increased hand hygiene awareness may be needed in athletic training ranging from instructor knowledge at educational institutions to practitioner compliance. The BOC Athletic Training Role Delineation Study states that athletic trainers and curriculum programs are expected to complying with regulatory standards in order to minimize the risk of injury and illness. This requires knowledge of laws, regulations, and policies at the institutional, state, and national level regarding the maintenance of a safe and sanitary environment in compliance with established standards (eg, OSHA). Perhaps athletic training curriculum programs should re-emphasize universal precautions for both students and clinical instructors on an annual basis. Certainly, students and practicing clinical instructors could benefit from the convenience of an on-line review course in hand hygiene. The examination of changes in hand hygiene knowledge and compliance following an annual review course is suggested. Additionally, the assessment of athletic trainers' knowledge of hand sanitizing agents is warranted given that many practicing settings do not provide athletic trainers with immediate access to hand washing stations.

Weiner SJ, Jackson JL, Garten S. Measuring continuing medical education outcomes: A pilot study of effect size of three CME interventions at an SGIM annual meeting. *J Gen Intern Med*. 2010;24(5):626-9.

Reviewed by Jennifer Doherty-Restrepo, Florida International University

Summary of research context and methods: The Accreditation Council for Continuing Medical Education (ACCME) is requiring Continuing Medical Education (CME) providers to assess the impact of their programs. Effective the 2008-2012 accreditation cycle, CME providers must employ assessment strategies to evaluate the efficacy of their educational programs using criteria such as knowledge acquisition and retention, confidence, performance, or patient outcomes. The evaluation criteria set forth by the ACCME raises concerns regarding the feasibility of assessing the impact of CME provided at a national meeting. Therefore, this pilot study was conducted to determine the feasibility of using a survey to measure the impact of two workshops and one pre-course on knowledge acquisition, knowledge sustainment after 9-months, and comfort-level with the content presented.

Summary of research findings: Changes in knowledge and comfort-level were calculated as effect size, or a standardized difference. All three CME programs demonstrated immediate knowledge acquisition. One CME program demonstrated knowledge sustainment after 9-months while the other two programs demonstrated knowledge decay to levels below that which was acquired. Comfort-level increased in the pre-course and declined in the workshop.

The authors discussed the methodological and logistical challenges they encountered while conducting this pilot study. These challenges included the validation of the data collection instrument, low response rate, and the lack of resources and personnel to collect, process, and analyze the data.

Implications for athletic training education/research: The Board of Certification mandates the completion of continuing education units in an effort to maintain practitioner competence. Assessing the efficacy of continuing education programs is warranted given the need to sustain and improve professional competence in the dynamic field of health care; however, it may not be feasible at national meetings. In athletic training research, examining the effects of different instructional techniques on continuing education outcomes (eg, knowledge acquisition, knowledge retention, and/or patient outcomes) while taking

into account the learning style preferences of athletic trainers is needed. This line of research could identify improved continuing education programming capable of achieving effective learning outcomes.

Murray S, Cytryn KN, Barrett TJ, Meinzer RL. Outcomes evaluation of a skill-based workshop targeting the use of spirometry in chronic obstructive pulmonary disease. *CE Meas*. 2010;4:50-7.

Reviewed by Kirk J. Armstrong, Georgia College & State University

Summary of research context and methods: Chronic obstructive pulmonary disease (COPD) affects more than 12.1 million Americans, with an estimated cost of $49.9 billion. Spirometry provides a sensitive and objective means to assess a patients' respiratory status; however, many primary care physicians are not familiar with this method of assessment nor do they use it to adequately assess respiratory functioning. To address these practice gaps related to spirometry, the American Academy of Family Physicians sponsored a continuing education initiative consisting of a printed summary of current research and recommendations for clinical care; a hands-on, case-based workshop related to conducting and interpreting spirometry testing; and an interactive, case-based online program extending the workshop case through follow-up over time to foster further learning and validation. Effectiveness was assessed through a mixed methods approach, including qualitative interviews pre- and 3 months post-workshop and quantitative questionnaires pre- and immediately post-workshop, as well as 3 months post-workshop.

Summary of research findings: Overall, workshop participants showed an increase in their knowledge and confidence in skill and clinical use of spirometry to diagnose COPD, while acknowledging an ongoing lack of knowledge and skill in using spirometry to monitor COPD and interpreting spirometry to influence treatment decisions. Post-workshop evaluations suggested that the hands-on workshop resulted in self-reports of increased confidence and an intent to use spriometry.

Implications for athletic training education/research: Like physicians, athletic trainers participate in a myriad of continuing education (CE) activities to bridge gaps in knowledge and skill to clinical practice. This article supports the need for interactive, hands-on CE activities that enable athletic trainers to engage directly with the presenter and necessary equipment to increase knowledge, skill, and confidence related to its use. To effectively bridge knowledge to practice, athletic trainers need to identify the gaps (ie, learning needs) and participate in CE activities that are designed to improve these specific deficits in their clinical practice.

Telner D, Bujas-Bobanovic M, Chan D, et al. Game-based versus traditional case-based learning: Comparing effectiveness in stroke continuing medical education. *Can Fam Physician*.2010;56:e345-51.

Reviewed by Stacy E. Walker, Ball State University

Summary of research context and methods: This investigation evaluated family physicians' enjoyment of and knowledge gained from game-based learning versus traditional case-based learning in a continuing medical education (CME) event on stroke prevention and management. Thirty two family physicians and 3 senior residents (N = 35) watched a 30 minute video about stroke prevention and management and were then randomly assigned into two groups (n = 17 case-based group; n = 18 game-based group). Both groups were then further divided into smaller groups of five or six. The case-based groups discussed cases regarding the content seen on the video within their respective smaller groups. The game-based groups played a board game called "Snakes and Ladders." All participants immediately, and then three months later, took a 40-point multiple choice knowledge exam and answered 11 statements about their enjoyment of the event, subjective learning, and whether they would attend similar future CME events.

Summary of research findings: Results showed no statistically significant difference between the case-based and game-based learning groups' scores on the knowledge exam immediately or at three months. Participants in the game-based group did report higher levels of satisfaction with the CME event (strongly agreed that the event was enjoyable [game-based = 94%; case based = 53%], that their attention was high throughout the event [game-based = 88%; case-based = 41%], and that they would register for a similar event in the future [game-based = 82%; case-based = 41%]).

Implications for athletic training education/research: These findings present an opportunity for continuing education providers to consider using game-based and case-based learning as modes of delivering continuing education content. Athletic training needs research similar to this to identify the short-term effects (eg, knowledge, patient care) of a continuing education event. Longitudinal studies are also needed to identify the long-term effects of continuing education on patient care. Lastly, barriers to implementation of knowledge and skills learned during continuing education needs to be investigated to identify and address such barriers.