

Evidence Based Practice in Health Care Online Module

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Abstract: The healthcare industry is faced with a challenge keeping practice in pace with rapidly developing evidence. Evidence-based practice (EBP) courses address this need by integrating evidence publication into practice. EBP training prepares health care providers to effectively explore clinical questions, research literature and make recommendations or implement change. While classroom offerings exist, an online module allowing professionals to learn at their own pace would help in spreading this information at a faster pace. The purpose of this instructional design project was to convert three classroom lessons to an online format to create ease of access for the learner, while engaging them in the content. The module was created using Articulate Storyline 360 and delivered via HealthStream, an online learning management system. The module was designed using the constructivist learning theory and principles of andragogy. This study involved 8 registered nurses who completed the course. Data collection included online testing and a participant survey.

Results indicated overall improvement in score between the pretest and posttest. Additionally, all participants rated themselves as sufficiently capable in each of the learning objectives of the module and provided positive feedback about the online module format. An online EBP course for health care providers can be an effective and efficient delivery of this content to increase clinician knowledge base related to EBP and ultimately improve the delivery of care.

Introduction

In today's rapidly changing field of healthcare, new evidence to influence care delivered to patients is produced daily. The gap between what we know, *evidence*, and what we do, *practice*, is unacceptable (Stevens, 2013). In the 1970s, with his publication *Effectiveness and Efficiency*, Archie Cochrane challenged the medical community to examine their care delivery structure and consider the need to deliver care based on the best evidence available, highlighting specifically randomized controlled trials (Shah & Chung, 2009). His efforts eventually led to the development of the *Cochrane Library*, "a collection of high-quality, independent evidence to inform healthcare decision-making. Six databases are available including the *Cochrane Database of Systematic Reviews* and a register of controlled trials" (The Cochrane Collaboration, 2017).

Evidence-based practice (EBP) courses provide a framework for clinicians to utilize such evidence, training individuals to form clinical questions, review literature and implement

changes to practice based on that evidence. This is paramount to closing the gap between evidence and practice. Current face-to-face delivery methods within the state of Hawaii have gained traction over the last several years but the face-to-face options create limitations for adult learners due to inflexibility of time and geographical limitations. For health care employees at Hawaii Pacific Health, there are two options for obtaining this skill set: 1) a face-to-face year long course hosted by the Hawaii State Center for Nursing at a cost of approximately \$1000 per attendee, or 2) an employer hosted six-month face-to-face course. While the employer hosted course comes at no cost to the employee, there is an organizational cost. There are also scheduling limitations presented due scheduling currently working providers attending class, along with scheduling conflicts for the lead instructor who teaches 80% of the course and is offered 4-5 times per year.

The purpose of this instructional design project was to evaluate the effectiveness of an online evidence-based practice (EBP) course in providing retention of key objectives of EBP for health care providers at Hawaii Pacific Health. A self-paced, online module, allowing learners to review at their own discretion, as well as completion at a timing of their own decision would help meet the needs of the busy. This online module may be integrated into a flipped classroom model for the current face-to-face offerings and provide more rapid dissemination EBP skills throughout the organization.

Literature Review

EBP in healthcare improves patient outcomes (Zimmerman, 2017). While there is a vast amount of evidence available, the process of identifying issues, forming appropriate clinical questions, and evaluating the literature available is not something all healthcare professionals are well versed in. EBP process models, such as the Iowa Model of EBP by Marita Titler provide a framework for clinicians to approach EBP (Zimmerman, 2017). Evidence based-medicine is composed of the best available evidence, clinical expertise, along with the patient's values (Shah & Chung, 2009). EBP requires that clinicians are able to, following the identification of an issue, form a question, assemble, critique and synthesize literature, and integrate clinical expertise and patient values (Schub & Walsh, 2017). In the absence of EBP, clinicians and health care professionals routinely practice in the methods that they were originally taught in school or training. Organizations often implement change for quality improvement based on desired what one individual thinks is a good idea. These methods do not necessarily coordinate with best practice based on the evidence available.

Since this module will be delivered to healthcare professionals, it was important to explore principles of adult learning to design a product that would meet their educational needs, while keeping them engaged. As discussed by Sogunro (2015), "adults prefer the student-centered or constructivism approach of instructional delivery whereby learners are more involved in the learning process than in the traditional approach" (p. 9). Shifting the approach to delivery of EBP to allow for an online module can assist in increasing delivery to clinicians applies the constructivist learning theory where learning is constructed by the learner and builds on prior knowledge. The Sogunro (2015) article on motivation goes on to quote Plato, "All learning has an emotional base" (p. 33). This

highlights the need to not only provide the elements of evidence-based practice, but to also incorporate real life examples that these health care providers encounter to make it meaningful for them, and to include the elements of why evidence-based practice is necessary.

Principles of andragogy further expand on adult learners benefiting from online learning that is student-centered and allows for continued autonomy with other activities in their lives (Decelle, 2016). An online EBP module provides participants with the ability to access the content at a time of their choosing, move through the content at their own pace, and review the course content at their own discretion. Decelle (2016) also highlights the need for “life application” (p. 1264), emphasizing the importance real life scenarios and application within the module examples, exercises and testing.

Project Design

The design of this project involved the transition of face-to-face course components to an online delivery method via a 3-lesson learning module. Within the development process, decisions included which lessons to deliver online, delivery system, authoring tool, recruitment planning and then actual content/module development. In reviewing the HPH face-to-face delivery option, the first 3 lessons were selected for online delivery: 1) Evidence-Based Practice Overview and the Iowa Model, 2). Forming a Clinical Question, and 3) Literature Critique and Synthesis. The learning objectives for the modules are:

1. Define evidence-based practice and use of the Iowa model for EBP.
2. Identify the elements of a PICO format clinical question.
3. Describe the process of literature critique and synthesis including levels of evidence.

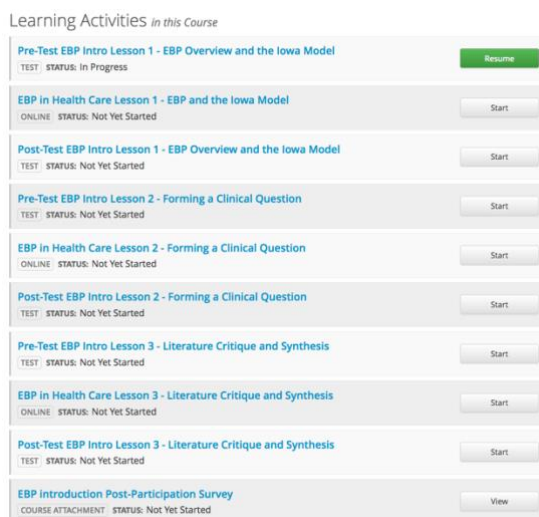


Figure 1. HealthStream Course Student View

integrated into HealthStream. The modules are available within the HealthStream platform to HPH users and reflected in more detail in Appendix A.

Determination of the delivery system for the content was made based on ease of access for the target audience. HealthStream learning management system was selected as this platform because it is currently used by HPH employees for accessing online learning, sample course screenshot in Figure 1. In an effort to engage the learner with varied levels of interactivity, the Articulate Storyline 360 authoring tool was selected for module design and development. The module was presented to the learner via HealthStream in sequential fashion easily guiding the learner through the course. The pre-tests and post-tests were delivered utilizing the testing platform

The lessons contain slide content from the current face-to-face course and was supplemented with video and interactive knowledge checks. Within the second lesson, a video was utilized to engage the learners in a multimedia experience. Additionally, throughout the lessons there were trigger activities, quizzes, and drag-and-drop activities. The interactive items were included at various places within the lesson to allow the learner to apply or validate what was already covered.

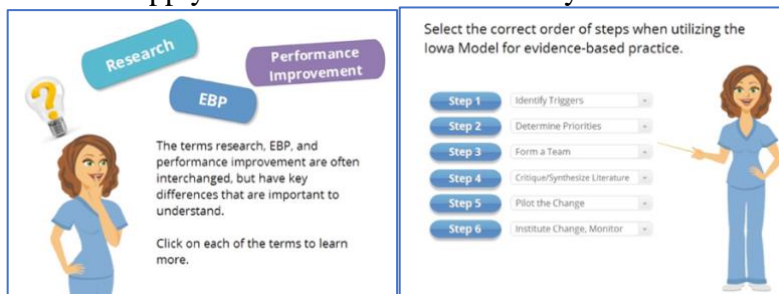


Figure 1. Interactive Module Elements

Methods

This project involved the development of a three-lesson module online course utilizing Articulate Storyline 360 authoring software and the HealthStream learning management system for delivery of the module to participants. The module, titled *Evidence-Based Practice in Health Care Introduction*, contains three sections, each with pre-test and post-test.

Participants recruited for this project were registered nurses at Hawaii Pacific Health (HPH). Based on licensure and current level of practice, the subjects have cognitive ability appropriate to the content delivered as well as affective motivation to increase knowledge of evidence-based practice to ensure optimal care delivery to the patients of HPH (Kasilingam, Ramalingam & Chinnavan, 2013). Additionally, the content of the course has the potential to impact their daily performance and improve the delivery of care to their patient population, thereby providing affective learner motivation. For this project, I recruited 11 participants via email request (Appendix B). Participants were asked to complete the online module taking approximately 95 minutes in entirety.

Each of the three lessons contains a pre-test and post-test related to EBP overview/Iowa Model, forming a clinical question, and literature critique and synthesis (Appendix C). Following completion of the three lessons, participants were required to complete a survey with questions regarding their experience with the module, their impression on relevance to their field of work and demographic information including their age and years in nursing practice. Quantitative data on immediate knowledge retention was reviewed from the pre-test and post-test comparison. The participation survey provided quantitative data extractable from rating scales utilized as well as the qualitative data via comments sections. At the conclusion of the learner module completion, test analysis reports indicating individual user performance, and test question data by question was exported from HealthStream for analysis. Additionally, participant survey results were extracted from SurveyMonkey (Appendix D).

Following agreement to participate in the project and completion of the consent form (Appendix E), participants received an assignment within HealthStream with the required elements as well as the due date. The LMS automatically provided the learner with emails reminders weekly, prior to due date, and an email reminder if they failed to complete by the assigned deadline. The learners were able to complete the module at their own pace at a date, time, location and computer of their choosing over a four-week timeframe. Eight participants completed all required assignments, pre-post tests and post-module surveys.

Results

The online module contained three pre-tests and post-tests allowing for quantitative analysis of knowledge retention and comprehension. The post-participation survey provided demographic information of participants, quantitative self-assessment of their completion of the course objectives, and qualitative evaluation of their experience in the online module. Test question analysis and learner satisfaction quantitative data is presented graphically and the comments or subjective, qualitative feedback have been summarized for trends or themes.

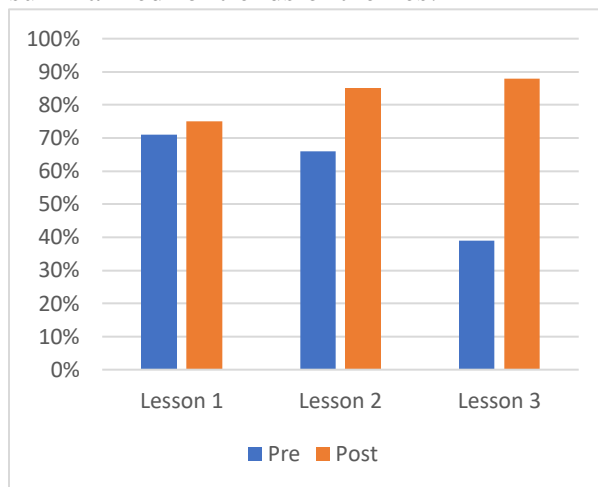


Figure 3. Pre-test and Post-test Results

Pre-Tests and Post-Tests

The data from within the module reflected in Figure 3 suggests that the module was effective in improving knowledge between the pre-test and post-test for the participants. It was predicted that Lesson 3 would be the most complicated lesson for the participants as this module covers advanced topics such as literature review, levels of evidence, types of research and how to synthesize data. This lesson had the largest impact on improving test scores from pre-test to post-test.

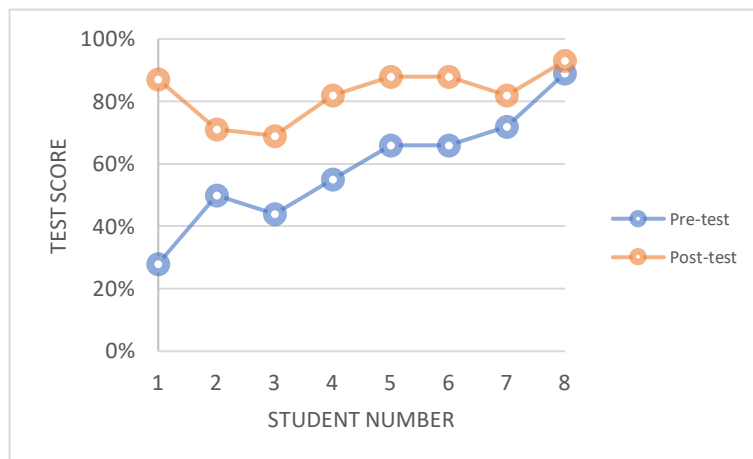


Figure 4. Individual Participant Test Score Analysis

The data by participant is reflected in Figure 4 with the students represented by numbers one through eight. The y-axis demonstrates improvement for each learner for their overall scores. An unexpected finding occurred when the individual student scores are reviewed by student and broken down by lesson is

that in 5 instances, where an individual lesson post-test score that was lower than the pre-test score. While the cause cannot be confirmed, it is possible that this variation occurred due to participant guessing or the variation in test questions between the pre-test and post-test.

Post Module Survey

The participant survey completed following the module asked the learners to evaluate their own ability related to each of the objectives of the module. The learners were asked to evaluate their ability based on a 4-point scale: (1) extremely limited ability (2) limited ability, (3) sufficiently capable, (4) extremely capable. The results are depicted in Figure 5 indicating the learners felt sufficiently capable in meeting the objectives for each of the three lessons.

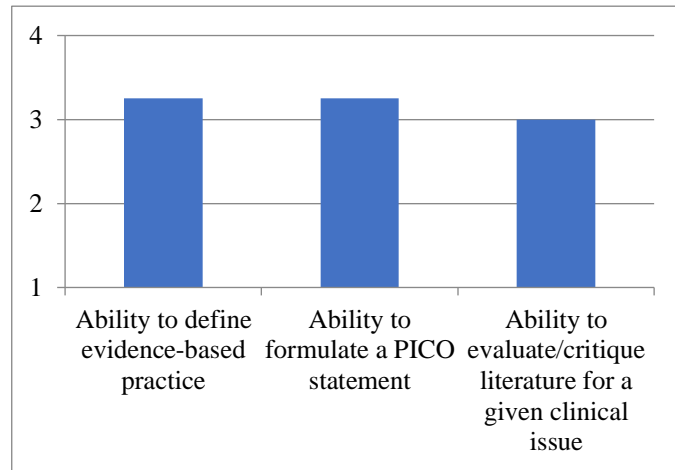


Figure 5. Learner Self-Assessment of Objective Achievement

In addition to the self-assessment, there was an attempt to ascertain the learner's perception on module use by asking the learner to rate each of the elements in Table 1 on a 4-point scale: (1) extremely dissatisfied, (2) dissatisfied, (3) satisfied, (4) extremely satisfied. Overall the participants were satisfied to extremely satisfied with the course elements evaluated with only 1 learner selecting (2) dissatisfied for "ease of understanding the content in the course".

Table 1. Participant Module Evaluation

Element	Average
Ease of access for the course	3.4
Ease of understanding the content in the course	3.3
Value of information in the course	3.5
Level of learner engagement in the course	3.4
Relevance of content to my practice as a healthcare professional	3.4

The participants included six individuals ages 36-45 and two individuals ages 46-55. The years of nursing practice was more than ten years for five of the participants, while 3 of the participants had less than 5 years' experience. With the limitation of the sample size, no direct correlation is able to be drawn between success in the module or a tendency to prefer an online module over face-to-face offerings, based on age or years in practice of the participants.

Participant Comments

Comments from the participants yielded some clear themes. Five participants stated that Lesson 2 on how to form PICO statements was their favorite lesson. This module had the

only audio component, an accompanying video and the highest level of interactivity with drag and drop, matching and multiple-choice questions built into the module. Furthermore, there were several comments on the enjoyment with practice questions and activities throughout all the modules to reinforce learning.

There were a few suggestions from the survey that will be considered in course development moving forward. The first was a request for audio accompaniment, made by more than one individual. Audio was left out based on informal peer surveys conducted during course development, but in hind sight, if audio is available, those that prefer that auditory experience can listen, and those that prefer to read can mute the audio option. There was also a request for the ability to review the content again (i.e. restart the module) without having to repeat the knowledge checks each time. This is possible by varying the publishing settings within the Articulate Storyline 360 authoring tool. The survey also yielded a few comments about content difficulty related to the levels of evidence and research types, for example quasi-experimental versus a qualitative study. This content was reported at “difficult” to understand by one participant and has been found to require significant reinforcement, even in the face-to-face class.

Additional Findings

One system issue was discovered during implementation. Within the module, each slide/page had a pre-determined length of time to be viewed, a default setting within the software that was not provided in the instructions to the participants. Additionally, there was a way to by-pass some of the sub-categories within the course, so that you could skip a slide. If a learner clicked passed a slide without waiting for the full length of time to pass or got lost in the navigation and missed one slide, when they reached the end of the module and attempted to take the post-test it would show “incomplete” for the module, and not allow the post-test to be initiated. This was identified by five of the eleven consented participants. While trouble-shooting instructions were provided, and two of the five moved on to complete the modules, there were three individuals that experienced this set-back, and did not adhere to the troubleshooting guidelines, and failed to complete the course.

Discussion & Conclusion

Recruitment

While this project has limitations related to sample size, the results are in support of an online learning module to deliver evidence-based practice content for health care professionals. There were some unexpected challenges during this project implementation, beginning with recruitment. The candidates recruited all work for Hawaii Pacific Health and are aware of the face-to-face course already in place. When they received a recruitment email, there were additional questions not addressed in reference to whether this would involve all the components of the face-to-face class, for example, if they agreed to participate, would they need to complete a project as required in the face-to-face class. This was not the case for this project, but there may be potentially other participants that were concerned about that and simply declined to participate without checking. Addressing this in the recruitment process by including more details in the email could have potentially increased participation.

Recruitment itself was conducted solely via email and in reviewing this process, in-person conversation or a phone call could have increased willingness to participate in the project.

System technical issue

As previously identified there was difficulty with the ability to move through the modules due to pre-determined length of time to be viewed. Additionally, there was a way to bypass some of the sub-categories within the course, so that you could skip a slide. If a learner clicked passed a slide without waiting for the full length of time to pass or got lost in the navigation and missed one slide, when they reached the end of the module and attempted to take the post-test it would show “incomplete” for the module, and not allow the post-test to be initiated. This was identified by five of the eleven total consented participants. While trouble-shooting instructions were provided, and two of the five moved on to complete the modules, there were three individuals that experienced this setback, and did not adhere to the troubleshooting guidelines, and failed to complete the course.

Module Design

In consideration of future design considerations for the module, consideration will be given to changing settings within Storyline 360 to change the functionality of the course allowing for advancement of the slides at a faster pace or creating a pathway through the content that is linear, ensuring each participant views all the content. Also, worth considering is the additional of at least one video within each module. The second lesson, which contained a video, was the most popular portion of the module. This lesson also contained the most interactive items with directly applicable clinical practice, which may warrant consideration of adding similar items with real world application to all the lessons.

Conclusion

Health care delivery is a rapidly changing environment with paramount importance of good patient outcomes. Arming clinicians with knowledge and skill for evidence-based practice will position them to provide the best care possible. An online module designed with the needs of the learners in mind that allows for more rapid diffusion of this information and skill to larger numbers of practitioners will improve not only the volume of individuals with the information but can lead to more effective delivery of care and better patient outcomes.

References

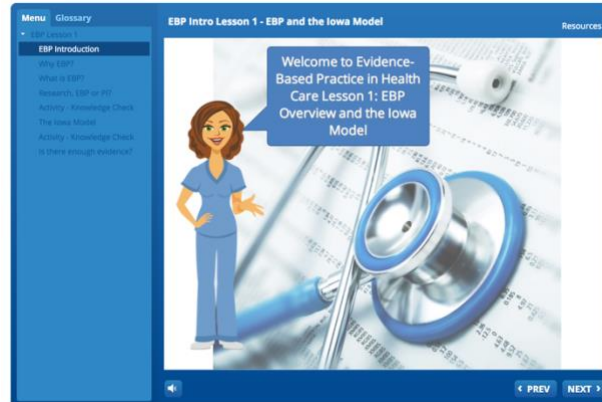
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Appendices

Appendix A – Module Screen Shots

Learning Activities *in this Course*

Pre-Test EBP Intro Lesson 1 - EBP Overview and the Iowa Model	Resume
TEST STATUS: In Progress	
EBP in Health Care Lesson 1 - EBP and the Iowa Model	Start
ONLINE STATUS: Not Yet Started	
Post-Test EBP Intro Lesson 1 - EBP Overview and the Iowa Model	Start
TEST STATUS: Not Yet Started	
Pre-Test EBP Intro Lesson 2 - Forming a Clinical Question	Start
TEST STATUS: Not Yet Started	
EBP in Health Care Lesson 2 - Forming a Clinical Question	Start
ONLINE STATUS: Not Yet Started	
Post-Test EBP Intro Lesson 2 - Forming a Clinical Question	Start
TEST STATUS: Not Yet Started	
Pre-Test EBP Intro Lesson 3 - Literature Critique and Synthesis	Start
TEST STATUS: Not Yet Started	
EBP in Health Care Lesson 3 - Literature Critique and Synthesis	Start
ONLINE STATUS: Not Yet Started	
Post-Test EBP Intro Lesson 3 - Literature Critique and Synthesis	Start
TEST STATUS: Not Yet Started	
EBP introduction Post-Participation Survey	View
COURSE ATTACHMENT STATUS: Not Yet Started	



Drag and drop each of the following examples to their appropriate basket below.

Are antibiotics the best treatment for otitis media in children under the age of 10?	How can we ensure patients that are issued prescriptions receive them from our pharmacy in a timely manner?	Do patients that receive antibiotics recover faster from otitis media than patients that do not receive antibiotics?
Research	Evidence-Based Practice	Performance Improvement

Menu Glossary EBP Intro Lesson 2 - Forming a Clinical Question Resources

EBP Lesson 2
Forming a Clinical Question
PICO
PICO Video
Knowledge Check - Matching
Knowledge Check - More Pra...
PICO Worksheet

What is the best evidence-based practice for reducing environmental noise on a hospital unit?

P	A hospital unit
I	Intervention based on literature, clinical expertise and patient values
C	Status Quo
O	Reduced environmental noise

PREV NEXT

Menu Glossary EBP Intro Lesson 2 - Forming a Clinical Question Resources

EBP Lesson 2
Forming a Clinical Question
PICO
PICO Video
Knowledge Check - Matching
Knowledge Check - More Pra...
PICO Worksheet

YouTube Using PICO to Refine your Question

How to use PICO to refine your research question

MEDICAL COLLEGE OF WISCONSIN LIBRARIES

<https://www.youtube.com/watch?v=Pw3Wlg7L2CA>

PREV NEXT

Menu Glossary EBP Intro Lesson 3 - Literature Critique and Synthesis Resources

EBP Lesson 3
Objectives
Step 1 - Find It
Step 2 - Read It
Step 3 - Critique It
Step 4 - Synthesize It
Resources

Click each of the buttons below to learn more.

Research Design Levels of Evidence

PREV NEXT

Menu Glossary EBP Intro Lesson 3 - Literature Critique and Synthesis Resources

EBP Lesson 3
Objectives
Step 1 - Find It
Step 2 - Read It
Step 3 - Critique It
Step 4 - Synthesize It
Resources

Reminder:
You can click the **Resources** button in the upper right hand corner to get a copy of literature critique form or literature matrix!

PREV NEXT

Appendix B – Recruitment and Participation Email

Recruitment Email

Aloha! I am recruiting Hawaii Pacific Health Staff to participate in an Evidence-Based Practice in Healthcare Online Module. There are efforts throughout healthcare in an effort to increase knowledge around evidence-based practice. While these efforts have widely been successful, the limitations of delivery via face-to-face classroom setting to learn the process can be a barrier to spreading this important information. In an effort to combat this, I have developed an online learning module as an introduction to evidence-based practice.

Your participation in this module will allow us to ascertain if an online module designed to cover elements of evidence-based practice in an online format is a feasible format to increase dissemination of information around evidence-based practice. The online module will consist of 3 lessons covering an overview of evidence-based practice, forming a clinical question, and literature synthesis and critique.

Should you decide to participate, you will receive a confirmation email with further details, followed by module assignment. The module will be available on your To Do list in HLC and requires completion by 3/15/18.

Please use the voting buttons in the email to indicate your preference for one of the following:

- Yes – Count me in!
- No Thank You – not at this time

Thank you for considering participation in this online learning exploration. If you have any questions, please feel free to contact me via email at bridget.lai@hawaiiipacifichealth.org or ext. 5-7557

Mahalo,
Bridget Lai
Manager Nursing Education
MEd Learning Design and Technology Student

Participation Email

Aloha! Thank you for agreeing to participate in an Evidence-Based Practice in Healthcare Online Module. As a reminder the module will be available on your To Do list in HLC effective 2/1/18 with a due date of 3/15/18. If you have any questions, please feel free to contact me via email at bridget.lai@hawaiiipacifichealth.org or ext. 5-7557.

Thank you for your participation in this online learning exploration.

Mahalo,
Bridget Lai
Manager Nursing Education
MEd Learning Design and Technology Student

Appendix C - Pre and Post Tests

Lesson 1 – EBP Overview and the Iowa Model Pre-Test

Please complete the following pre-test to determine your baseline knowledge on evidence-based practice and the Iowa model.

1. Evidence based practice is best described as the process of:
 - a. asking a question and conducting trials to find the answers.
 - b. determining how to implement a change to improve quality of care delivered.
 - c. examining existing literature to determine best practice.
 - d. updating traditional techniques with new technology.

ANSWER: c
2. What would be an example of evidence-based practice project?
 - a. Implementing a new, more accurate pulse ox machine that was provided as an upgrade from a vendor
 - b. Implementation of a new mobility after surgery protocol based on review and synthesis of literature and research findings.
 - c. Conducting a randomized control trial to determine the efficacy of aspirin in the treatment of acute myocardial infarction.
 - d. Implementing new screening process for fall risk assessment following 3 falls last week on a hospital unit.

ANSWER: b
3. Within the Iowa model for evidence-based practice which of the following would be examples of problem focused triggers?
 - a. New research available on medication for migraine treatment.
 - b. Updated guidelines released from the American heart association on myocardial infarction management.
 - c. Increase in patient falls on a post-operative neurological unit
 - d. New randomized control trial results on suctioning use in pediatric bronchiolitis.

ANSWER: c
4. After identifying a trigger, the next step in the Iowa model for evidence-based practice is which of the following?
 - a. Form a team
 - b. Critique and synthesize literature
 - c. Determine if the trigger is an organizational priority
 - d. Pilot a change

ANSWER: c
5. A key element in the success of evidence-based practice implementation is:
 - a. rapid speed of change.

- b. dissemination of results.
- c. simultaneous research on the same process/topic.

ANSWER: b

6. In the event that there is not sufficient research available on a given topic, reasonable next steps may include which of the following?
- a. Conducting additional research
 - b. Review of case reports
 - c. Considering expert opinion
 - d. All of the above

ANSWER: d

Lesson 1 – Overview and the Iowa Model Post-Test

Please complete the following post-test to determine your knowledge on evidence-based practice and the Iowa model.

1. Beyond literature review, what other elements are components of evidence-based practice?
 - a. Expert opinion and personal experience
 - b. Personal experience and patient values
 - c. Patient values and clinical expertise
 - d. All of the above

Answer: c
2. All of the following are examples of evidence-based practice projects *EXCEPT*:
 - a. Review of literature to determine the impact of mobility of patients during active labor on length of labor and pain management regimens.
 - b. Implementation of an online training module for a unit in response to repeated errors with blood administration.
 - c. Recommendation for a change in practice from estimated blood loss to quantitative blood loss based on thorough literature review.
 - d. Recommendation for an extubation protocol for patients in a pediatric intensive care unit following identification of trigger, forming a team, and review of literature.

Answer: b
3. Within the Iowa model for evidence-based practice, which of the following would be examples of knowledge focused triggers?
 - a. Increase in medication errors related to chemotherapy.

- b. Three incident reports of blood transfusions occurring without appropriate consent.
- c. Publication of a meta-analysis of over 200 randomized control trials for delayed cord clamping in neonates under 32 weeks gestation.
- d. Placement of a new manager over an emergency department with recommendation for triaging chest pain based on experience at their prior facility.

Answer: c

4. Following identification of a trigger and formation of a team, the next step in the Iowa model for evidence-based practice is which of the following?
- a. Assemble relevant research
 - b. Pilot a change
 - c. Disseminate results
 - d. Determine if the trigger is a priority for the organization

Answer: a

5. In the event that there is not sufficient research available on a given topic, reasonable next steps may include which of the following?

- a. Conducting additional research
- b. Review of case reports
- c. Considering expert opinion
- d. All of the above

ANSWER: d

6. Following a literature review for nursing handoff, the literature compellingly indicates increased safety for patients along with increase in patient satisfaction when bedside handoff is utilized. Which of the following is the most effective next step?

- a. Form a team
- b. Pilot a change
- c. Consult others for expert opinion
- d. Consider other triggers

Answer: b

Lesson 2 – Forming a Clinical Question using the PICO Model Pre-Test

Please complete the following pre-test to determine your baseline knowledge on use of the PICO model in forming a clinical question.

1. The P in PICO stands for:
- a. Population
 - b. Problem
 - c. Patient
 - d. All of the above

ANSWER: d

2. Relevant factors for the patient or population may include which of the following?
 - a. Gender
 - b. Age
 - c. Diagnosis
 - d. All of the above

ANSWER: d

3. In the process of EBP, when should the "I" or intervention be identified?
 - a. Prior to literature search to guide searching
 - b. During the literature search to allow for continued adjustment
 - c. Following the synthesis of literature based on findings

ANSWER: c

4. In forming a clinical question, it is important to realize that in researching interventions, the question:
 - a. may be easier if in PICO format.
 - b. is more important than its format.
 - c. will lead you to hundreds of articles that must be read.
 - d. may be more useful the more general it is.

ANSWER: a

5. In the following question, identify the "P" that would be used in a PICO statement:

What is the best evidence-based practice for reducing environmental noise on a hospital unit?

- a. Patients on hospital unit
- b. Environmental noise on hospital unit
- c. Staff on hospital unit
- d. The hospital

ANSWER: b

6. In the following PICO statement, identify the "C" or Control:

In patients with recurrent furunculosis, do prophylactic antibiotics, compared to no treatment, reduce the recurrence rate?

- a. No treatment
- b. Prophylactic antibiotics
- c. Patients with recurrent furunculosis
- d. Reduction in recurrence of furunculosis

ANSWER: a

Lesson 2 – Forming a Clinical Question using the PICO Model Post-Test

Please complete the following post-test to determine your knowledge on use of the PICO model in forming a clinical question.

1. What is the 'C' (control) in the following PICO statement?
In middle-aged males with suspected myocardial infarction, are serial 12-lead ECGs compared to one initial 12-lead ECG more accurate in diagnosing an acute myocardial infarction?
 - a. Middle-aged males with suspected myocardial infarction
 - b. Serial 12-lead ECGs
 - c. One initial 12-lead ECG
 - d. Diagnosis of acute myocardial infarctionAnswer: c

2. Which of the following are relevant factors for the 'P' (patient, population or problem) in a PICO statement?
Are 30 to 50 year old women who have high blood pressure compared with those without high blood pressure at increased risk for an acute myocardial infarction during the first year after hysterectomy?
 - a. Women
 - b. 30 to 50 year old women
 - c. 30 to 50 year old women with high blood pressure
 - d. 30 to 50 year old women without high blood pressureAnswer: b

3. Which of the following is true about PICO statements?
 - a. Assists in structuring the literature search process.
 - b. Allows for review of the most articles possible.
 - c. Does not require an outcome to be complete.
 - d. Creates confusion around clinical questions.Answer: a

4. What is the 'O' (outcome) examined in the following PICO statement?
In African-American female adolescents with hepatitis B, how does acetaminophen compared to ibuprofen affect liver function?
 - a. African-American female adolescents with hepatitis B
 - b. Acetaminophen administration
 - c. Ibuprofen administration
 - d. Liver functionAnswer: d

5. If you were examining the efficacy of antibiotic treatment in otitis media where the intervention is antibiotic administration, which of the following could be a control?
 - a. Patients without otitis media
 - b. Patients that do not receive antibiotics
 - c. Duration of otitis media symptoms
 - d. None of the above

Answer: b

Lesson 3 – Literature Critique and Synthesis Pre-Test

Please complete the following pre-test to determine your baseline knowledge on literature critique.

1. Which of the following types of research aims to understand an individual's experience?
 - a. Quantitative
 - b. Qualitative
 - c. Case Study
 - d. Randomized control trial

ANSWER: b
2. Level I evidence would be found in which of the following types of literature?
 - a. Systematic Review
 - b. Cohort Studies
 - c. Case Reports
 - d. Expert Opinion

ANSWER: a
3. Expert opinion would be considered which of the following?
 - a. Level I Evidence
 - b. Level III Evidence
 - c. Level V Evidence
 - d. Level VII Evidence

ANSWER: d
4. A specific statistical method for categorizing and quantitatively summarizing data to provide more precise estimates of the effects of healthcare variables than those estimates derived from the single studies alone.”
 - a. Cohort Study
 - b. Case Report
 - c. Meta-analysis
 - d. Randomized Control Trial

ANSWER: c

5. In examining research design, randomization occurs in which of the following types of quantitative studies:

- a. Experimental
- b. Quasi-experimental
- c. Non-experimental
- d. None of the above

ANSWER: a

6. A potential limit to using an existing guideline for implementation of an evidence-based practice change may include which of the following?

- a. Easier to critique
- b. Quality of the evidence used
- c. Easier to build consensus
- d. Less resource intensive

Answer: b

Lesson 3 – Literature Critique and Synthesis Post-Test

Please complete the following post-test to determine your baseline knowledge on literature critique and synthesis.

1. A randomized control trial is an example of which for the following types of research?

- a. Level I Evidence
- b. Level II Evidence
- c. Level III Evidence
- d. Level IV Evidence

Answer: b

2. Level III evidence would be found in which of the following types of literature?

- a. Case controlled, cohort, longitudinal studies Meta-analysis
- b. Randomized Controlled Trial
- c. Meta-analysis
- d. Quasi-experimental design

Answer: d

3. Systematic Review would be considered which of the following?

- a. Level I Evidence
- b. Level II Evidence
- c. Level III Evidence
- d. Level IV Evidence

Answer: a

4. Quantitative research includes all of the following *EXCEPT*:

- a. Cohort surveys
- b. Experimental
- c. Quasi-experimental
- d. Non-experimental

Answer: a

5. Which of the following is true when considering utilization of guidelines?

- a. All guidelines should be implemented.
- b. Once you find a guideline, you can stop your literature search.
- c. Guidelines should be evaluated for the quality of evidence used in their development.
- d. Guidelines do not require critique.

Answer: c

Appendix D – Post Participation Survey



Evidence-Based Practice Online Module Participation

Thank you for completing the Online Module for Introduction to Evidence-Based Practice. Please take a few moments to complete the survey below to provide feedback on the experience. 📝

OK


* 1. Please rate your ability related to each of the statements below using the following scale of 1-4: 🗨️

	1 – Extremely limited ability	2 – Limited ability	3 – Sufficiently capable	4 – Extremely capable
Ability to define evidence-based practice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to formulate a PICO statement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ability to evaluate/critique literature for a given clinical issue	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 2. Please rate your experience by using the following scale of 1-4: 🗨️

	1 – Extremely Dissatisfied	2 – Dissatisfied	3 – Satisfied	4 – Extremely Satisfied
Ease of access for the course	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Ease of understanding the content in the course	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Value of information in the course	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Level of learner engagement in the course	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Relevance of content to my practice as a healthcare professional	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 3. Please describe the most valuable portion of the course, and indicate why you feel this is the case. 

* 4. What comments or suggestions do you have for improving the course moving forward? 

5. Additional Comments: 

* 6. Please select your age group. 

☐ 18-25

☐ 46-55

☐ 26-35

☐ >55

☐ 36-45

* 7. How many years have you been in nursing practice? 

☐ Less than 5 years


☐ 5 years to 10 years

☐ More than 10 years

* 8. Have you participated in a formal EBP training course before? 

☐ Yes

☐ No

9. Please describe your previous EBP course indicating location, length of course, and why you participated, i.e. voluntary, required, etc. 

Appendix E – Consent Form

University of Hawai'i

Consent to Participate in Research Project:

Evidence-Based Practice in Health Care Online Module

My name is Bridget Lai, and I am a graduate student at the University of Hawaii at Manoa in the Department of Learning Design and Technology. I am doing a research project as part of the requirement for earning my Master's degree. The purpose of my project is to evaluate an online interactive module on evidence-based practice in health care. I am asking you to participate because you are a health care provider at Hawaii Pacific Health.

Activities and Time Commitment:

If you choose to participate in this project, you will be assigned an online module via HLC that will be available on your To Do list effective 2/1/18 and due 3/15/18. This module will contain 3 lessons, each with a pre-test and post-test and at the completion of the 3 modules an online participant survey. The module is constructed to provide an interactive process with visually engaging content delivery, intermittent knowledge checks, and real-world scenarios. The pre-tests and post-tests are multiple choice, and the participant survey will be completed via SurveyMonkey. All items are to be completed by 3/15/18 and can be completed at a time of your choosing. Each module, including pre-test and post-test will take approximately 30 minutes each. The survey at the end of the module takes approximately 5 minutes to complete.

Benefits and Risks:

Completion of this module will provide an overview of evidence-based practice, forming clinical questions, and literature critique and synthesis. The major benefit to you is that participation in this study provides an easy means for expanding your knowledge around the process and utilization of evidence-based practice in healthcare. There is no risk to you in participating in this research project.

Privacy and Confidentiality:

I will keep all information in a safe place. Only my University of Hawaii advisor and I will have access to the information. Other agencies that have legal permission, such as the University of Hawaii Human Studies Program, have the right to review research records for this study. When I report the results of my research project, I will not use your name. I will not use any other personal identifying information that can identify you and will report my findings in a way that protects your privacy and confidentiality to the extent allowed by law.

Voluntary Participation:

Your participation in this project is completely voluntary. You may stop participating at any time. If you stop being in the study, there will be no penalty or loss to you.

Contact Information:

For any questions regarding the project, please feel free to contact myself (contact information listed below) or my University of Hawaii faculty advisor, Dr. Grace Lin at gracelin@hawaii.edu. For any questions regarding your rights as a research participant, please contact the UH Manoa Office of Research Compliance Human Studies Program at (808) 956-5007.

If you agree to participate in this project, please print your name, sign, and date this signature page and return it to:

Bridget Lai, Principal Investigator
Email: bridget.lai@hawaiiipacifichealth.org
Phone: (808) 535-7557

Statement of Consent:

I have read and understand the information provided to me about being in the research project, Evidence-Based Practice in Health Care Online Module. My signature below indicates that I agree to participate in this research project.

Printed name: _____

Signature: _____

Date: _____

You will be given a copy of this consent form for your records