A Pilot project to build e-health literacy among university students in Hong Kong

Julia L.Y. Chan¹, A. Leung², V.C.L. Chiang², H.C.W. Li², E.M. Wong², A.N.C. Liu³, S. S.C. Chan²

¹Medial Librarian, Branch Libraries Services Team Leader, Yu Chun Keung Medical Library, University of Hong Kong, Hong Kong, China
²Department of Nursing Studies, Faculty of Medicine, University of Hong Kong, Hong Kong, China
³Department of Law, Faculty of Law, University of Hong Kong, Hong Kong, China
University of Hong Kong
University of Hong Kong

- Founded in 1911
- Oldest tertiary institution in Hong Kong

LKS Faculty of Medicine

- Founded in 1887 as the Hong Kong College of Medicine for Chinese
- Accorded the position of premier Faculty when the University was opened in 1912
LKS Faculty of Medicine
YCK Medical Library
"The degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions".
E-Health Literacy Program

Objectives

- To develop students with the ability to retrieve reliable health information from the Internet
- To equip students with critical thinking skills to evaluate health resources
- To promote information seeking and independent life-long learning behavior
- To assess the effectiveness of web-based learning in e-health literacy
- To assess the effectiveness of the e-health literacy program
Participants

HKU Undergraduates (2008-09)

- 2 recruitments (1st & 2nd semester)
- 117 students recruited
- 88 completed pre- & post-intervention measurement
Participants Profile

- 88 students – Intervention: 43, Control: 45
- Age: 19 - 22
- Sex:
  - Intervention - male: 46.5%, female: 53.5%
  - Control group - male: 48.9%, female: 51.1%
Participants Profile

- Faculty of Science, Dentistry & Medicine: 26%
- Faculty of Engineering: 25%
- Faculty of Arts, Education & Law: 22%
- Faculty of Business and Economics: 17%
- Faculty of Social Science: 10%
Study Design

- Face-to-face library workshop (I group) - (1.5 hrs)
- Web-based learning (WebCT) on evidence-based practice (I group) - (4 weeks)
- Web-based video case study - case study analysis, formulate search plan, search for evidence, critically evaluate health information (I & C groups)
- Face-to-face tutorial on legal & ethical issues on e-health (I & C groups) - (1 hr)
Recruitment
\( n = 117 \)

Discontinued
\( n = 29 \)

Intervention group
\( n = 45 \)

Induction Workshop

Library Workshop

Web-based learning – EBP

Web-based video case study

Tutorial on legal & ethical issues

Data collection –
- Questionnaire (pre-intervention)

Search plan analysis

Data collection/analysis –
- Questionnaire (post-intervention)
- Survey
- Focus group

Control group
\( n = 43 \)

Induction Workshop

Web-based video case study

Tutorial on legal & ethical issues

Recruitment
\( n = 117 \)

Discontinued
\( n = 29 \)

Intervention group
\( n = 45 \)

Induction Workshop

Library Workshop

Web-based learning – EBP

Web-based video case study

Tutorial on legal & ethical issues

Data collection –
- Questionnaire (pre-intervention)

Search plan analysis

Data collection/analysis –
- Questionnaire (post-intervention)
- Survey
- Focus group

Control group
\( n = 43 \)

Induction Workshop

Web-based video case study

Tutorial on legal & ethical issues
Library Workshop

- Introduce major information tools in medical & health sciences
- Search features & strategies of major databases
  - Medline, MedlinePlus, CINAHL, PsycINFO
- Identify health keywords & synonyms
- Perform precise searching using Medical Subject Headings
- Locate health journal articles & other types of materials on specific health topics
Web-based Tutorial (WebCT)

- Introduce EBP (Evidence-based Practice), EBP cycle & PICO element
- Strategies to formulate focused questions & search for evidence
- 2 case-based exercises with guidance to search for best practice
- Critical assessment of quality of resources
EBP Cycle (please click on the 5A’s for detailed information)

- **APPLY** the evidence
- **APPRAISE** the evidence
- **ACQUIRE** the evidence
- **ASK** answerable questions
- **Assess**

**Identify the Clinical Problem**

EBP starts and ends with the patient. To begin this process, you should identify the clinical problem of the patient and have a clear idea on the type of information you are looking for.
**Ask - PICO Questions**

<table>
<thead>
<tr>
<th>Patient / Problem</th>
<th>Patient characteristics (age, sex, race, past medical history, etc.) / clinical problem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intervention</td>
<td>Therapy, diagnostic test, prognostic factor, exposure</td>
</tr>
<tr>
<td>Comparison</td>
<td>Compared to: gold standard, placebo, no medication, alternative therapy</td>
</tr>
<tr>
<td>Outcome</td>
<td>Effect of Intervention, clinical outcome</td>
</tr>
</tbody>
</table>
### Type of Question / Type of Study

Two additional elements of the well-built clinical question are the type of question and type of study. This information can be helpful in focusing the question, searching for the best study design and the most appropriate type of evidence.

<table>
<thead>
<tr>
<th>Type of Question</th>
<th>Suggested Type of Study</th>
</tr>
</thead>
<tbody>
<tr>
<td>Therapy</td>
<td>Treatment to achieve outcome. May include drug therapy, surgical intervention, etc.</td>
</tr>
<tr>
<td></td>
<td>randomized controlled trial, double-blind</td>
</tr>
<tr>
<td>Diagnosis</td>
<td>Identification of a disorder in a patient presenting with specific symptoms</td>
</tr>
<tr>
<td></td>
<td>controlled trial</td>
</tr>
<tr>
<td>Prognosis</td>
<td>Progression of disease over time</td>
</tr>
<tr>
<td></td>
<td>cohort studies</td>
</tr>
<tr>
<td>Etiology / Harm</td>
<td>Causes of disease, negative impact from an intervention or other exposure</td>
</tr>
<tr>
<td></td>
<td>cohort studies, case series</td>
</tr>
</tbody>
</table>
Assess - Identify the Clinical Problem

Practice 2 - Clinical scenario

Your uncle John, a 50-year-old man, had coronary heart disease and was admitted to hospital. It was fortunate that his case was uncomplicated and he was discharged after five days. The doctor referred him to a cardiac rehabilitation program and encouraged him to take regular exercise to regain optimal physical condition.

Coronary heart disease is a major source of mortality in Hong Kong. You are worried whether regular exercise is effective in helping your uncle to reduce risk of heart disease.
was fortunate that his case was uncomplicated and he was discharged after five days. The doctor referred him to a cardiac rehabilitation program and encouraged him to take regular exercise to regain optimal physical condition.

Coronary heart disease is a major source of mortality in Hong Kong. You are worried whether regular exercise is effective in helping your uncle to reduce risk of heart disease.

(Please press <enter> after inputting data in each of the box)

Patient / Problem: coronary heart disease

Intervention: exercise

Is alternative therapy recommended?
Ask - Formulate Answerable Clinical Questions

Compare your answer to that we have formulated

Patient / Problem: coronary heart disease

Intervention: exercise

Comparsion: do not exercise

Outcome: reduce risk of heart disease

Criteria / Limitation: human, English, 50-year-old

Question: In a 50-year-old man with acute myocardial infarction, how effective is regular physical training and healthy diet help to reduce progression of the disease?
Acquire - Search for the Best Evidence

Next, try to match the clinical questions to appropriate search strategies. Search the literature in the following databases for relevant articles and best evidence. Then, write down the search strategies and results for the different databases.

Please use the tutorial [T] to learn more about searching individual database.
# Search for the Best Evidence

<table>
<thead>
<tr>
<th>#</th>
<th>Search Strategies</th>
<th>PubMed</th>
<th>Ovid Medline</th>
<th>CINAHL</th>
<th>PsycINFO</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

[Compare]
EBP Tutorial

Compare your answer to those we have formulated
(The following sample searches were conducted in June 2008)

<table>
<thead>
<tr>
<th></th>
<th>Search Strategies</th>
<th>PubMed</th>
<th>Ovid Medline</th>
<th>CINAHL</th>
<th>PsycINFO</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>coronary heart disease (coronary disease)</td>
<td>196961</td>
<td>159315 (Explode + keyword search)</td>
<td>16876</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>exercise</td>
<td>165567</td>
<td>159441 (Explode + keyword search)</td>
<td>50099</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Hong Kong</td>
<td>36099</td>
<td>10855 (Explode + keyword search)</td>
<td>2902</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>1 and 2 and 3</td>
<td>23</td>
<td>6</td>
<td>4</td>
<td>70</td>
</tr>
<tr>
<td>5</td>
<td>Limit 4 to (English AND humans AND)</td>
<td>7</td>
<td>5</td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>
Video Case-based Study

1. Cancer Prevention
   Compare with other fruits, will the intake of banana be more effective in reducing the risk of cancer?

2. Weight Reduction
   Will a person be able to lose weight by taking a diet with high intake of meat?
Video Case-based Study

- Topics – current health problems faced by adolescent (contemporary lifestyle, habits)
- Nursing staff acted as online moderators to provide guidance & mentor support to facilitate students’ learning
- Students worked independently
- Course management system allowed communication & collaboration among faculty & students
Video Case-based Study
Evaluation – Quantitative (1)

Questionnaire: Pre- & Post- test on e-health literacy

- Test of Functional Health Literacy in Adults (ToFHLA) – assess reading comprehension (e.g. informed consent, medical procedures) & numeracy skill (e.g. prescription directions)
- eHEALS – measure combined knowledge, comfort & perceived skills at finding and evaluating health information
Evaluation – Quantitative (2) scores / grades

Search plan:
video case-based study

- Formulate focused questions
- Search for evidence
- Retrieve appropriate evidence
Evaluation – Quantitative (3)

Survey - 5-point Likert scale

- Satisfaction
- Computer literacy
- Usefulness
- Effectiveness of e-health program
Evaluation - Qualitative

Focus Group

- Students’ experience of library workshop/ tutorial
- Views of the teaching method (usefulness, content, modes of delivery …)
- Views of modes of learning (length of program, knowledge & skills to be attained, applicability to their study)
- What would they like to include in the program
- Strengths & weaknesses of the program
Results (1)

Questionnaire: Pre- & Post- test

- e-Health Literacy scores revealed positive impact of the program
- Significant improvement in post- over pre-test scores both for I & C groups
- Students’ skills & knowledge in locating & evaluating health information on the Internet were increased
- I group showed greater improvement than C group
Results (2)

Search plan

- Markings revealed success of the participants in formulating search plan & searching for evidence
- I group showed greater improvement than C group
Results (3)

Survey

Positive ratings in students’ satisfaction, usefulness & effectiveness of e-health program
- the course was “just right”
- well organized, easy to understand
- ample opportunities to ask questions
- clear learning objectives, innovative teaching strategies
- appropriate assessment strategies
- appropriate level of workload
Focus Group (1)

A. Course contents & structure of e-health program

- “very creative course”
- “very informative website”
- meeting their information needs
- “learn how to search for health information on the internet & how to distinguish the reliability of the information”
Focus Group (2)

B. Web-based learning

- Accessibility, interactivity, flexibility to study anytime, anywhere, at own pace
- Learn to become independent learners & problem solvers
- Absence of visual cues
- Sense of isolation
- Lack of face-to-face contact
Focus Group (3)

C. Suggestions for improvement

- More contents, more videos, more lectures support, and stronger guidance
- Games & quizzes could be embedded in the course to further enhance learning
- Expand the course curriculum to one or two years, to be offered as an optional course for university students
Future Directions (1)

- A one-stop shop website within WebCT could be developed providing information at point-of-need:
  - course contents, EBM resources, Libraries’ homepage, online catalogue, guided readings & essential web-based materials.

- More innovative programs could be constructed to arouse active, critical thinking:
  - group interaction, case studies, interactive PowerPoint presentations, quizzes, competitions & practical exercises.
Future Directions (2)

- A special teacher-student interaction channel could be set up to deliver multimodal educational contents & a wide variety of communication, tracking & assessment tools.

- Design, appropriateness, resources & other issues should be considered prior to determining utilizing purely e-learning or the blended approach.
Conclusion

- Web-based learning is effective, offering self-directed, flexible & interactive learning
- Via e-learning platform, students have increased their comfort & competency level in acquiring, selecting & evaluating e-health resources
- Problem-based approach has fostered critical thinking, information seeking & life-long learning behavior
- Target: to empower students to become more educated, more active advocates for better health care & healthier lifestyle
Certificate & Incentives
Goal - University-wide (1)

- Inline with HKU new four-year undergraduate Curriculum’s Action Plan – underlying theme – transforming student learning
- Promote increased flexibility in the delivery, participation and modes of learning (visual, aural, tactic) in the curriculum reform
- Promote information technology in education
Goal - University-wide (2)

- Encourage self-directed learning
- Extend the initiative of evidence-based approach in information literacy programs via the e-learning platform to other faculties in the university
Questions?

Thank you

謝謝