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Evidence Appraisal Mobile Educational Game

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Purpose:
Mobile educational applications can be a useful tool for nurse educators in academia and practice to promote learning or engage learners (Pilcher, 2016). Applications have been associated with improvements in knowledge, confidence, and reduced learner anxiety among nursing students (O'Connor & Andrews, 2018). Evidence-based practice (EBP) principles and processes can be taught using games (Mick, 2016; Milner & Cosme, 2017; Wonder & Otte, 2015) that can be developed into mobile educational applications. We enlisted the help of our computer science colleagues at our university to create an application for our Evidence Appraisal Game that educators can use to reinforce Melnyk & Fineout-Overholt's (2019) EBP *Step 3: Critical Appraisal of Evidence*.

This application aims to be a learning tool with a fun interactive design that will help nursing and other health professions students learn how to identify the level of evidence (LOE) when presented with short scenarios describing a research study or another type of evidence.

Methods:
Because there is no universally accepted LOE hierarchy, we created our own with LOEs ranging from 1 for systematic review/meta-analysis using randomized control trials to 9 for manufacturer's recommendations. The game has 5 levels (e.g. practice, basic, proficient, advanced, expert) that increase in difficulty and the goal is to match the presented scenario with the correct LOE and complete as many levels as possible successfully.

Principles of gaming and Human Computer Interface (HCI) theory were used in the application development. For example, the practice and basic levels have hints to help the learner and the background screen turns green when the correct answer is given. Doctor of Nursing Practice (DNP) and Physician Assistant (PA) students used the application after receiving a didactic lecture on critical appraisal. Students completed a short Likert-type questionnaire on their experience with the application. Responses ranged from "Strongly Disagree =1" to "Strongly Agree = 5".

Results:
Table 1 displays the Evidence Appraisal Mobile Educational Game evaluation results. Mean ratings for both DNP and PA students demonstrate that the application was fun and effective for identifying LOE for different evidence types.

Table 1.
Evidence Appraisal Mobile Educational Game Evaluation Results

| | DNP students | PA students |

	n=16	n=40
Question	Mean(SD)	Mean(SD)
The mobile education game was a fun way to practice building my evidence appraisal skills.	4.56(.63)	4.00(.91)
My understanding of how to differentiate between research and other types of evidence increased after playing the game.	4.25(.68)	3.95(.82)
My understanding of how to determine the type of study design increased after playing the game.	4.06(.68)	3.88(.88)
My understanding of how to select the level of evidence based on evidence type increased after playing the game.	4.31(.60)	3.80(.85)
The mobile education game was beneficial to my learning.	4.63(.50)	3.98(.77)

Questions adapted from Mick (2016).

Conclusion:
The Evidence Appraisal Mobile Educational Game may provide a helpful tool for use in both academic and clinical settings to help nursing and other health professions students identify LOE when presented with different types of evidence.

Title:
Evidence Appraisal Mobile Educational Game

Keywords:
Education Technology, Evidence-based practice and Games

Abstract Summary:
We created the Evidence Appraisal Mobile Education Game to be a learning tool with a fun interactive design to help nursing and other health professions students learn how to identify the level of evidence when presented with short scenarios describing a research study or another type of evidence.

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Author Summary: Dr. Kerry A. Milner is an Associate Professor in the College of Nursing at Sacred Heart University where she teaches in the DNP program. She has had several principal investigator and co-principal investigator grants to conduct research to improve care of critically ill patients. She has also carried out many EBP-QI projects in acute care. Dr. Milner has more than 35 peer reviewed publications.

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Author Summary: My expertise is in computer science and game development. My most recent game development project was funded by a multi-million dollar grant from the National Science Foundation to teach students about prehistoric times using an artificial intelligence environment.

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Author Summary: I am a recent graduate of Sacred Heart University where I earned a

Bachelor of Science in Computer Science. I am proficient at creating mobile applications and I was the programmer for the Evidence Appraisal Game App.