Background: As the nursing science evolves, the focus for evidence-based practice (EBP) has shifted from teaching and learning to understanding and implementing. In both cases, instruments are important to measure the achievement of learning objectives and to assess the development of new competencies. For nursing students, the initial exposure to EBP occurs early in undergraduate programs. As nursing students graduate and enter the workforce, they should have the basic knowledge and minimum skills to incorporate evidence into their daily clinical practice. To facilitate this outcome, experiential learning activities can be threaded through a nursing curriculum to facilitate. However, a robust assessment process is essential to determine if students achieve the learning objectives and can demonstrate competencies in EBP. There are limited studies about nursing students and the achievement of competencies in EBP as well as the longitudinal impact of curriculum design on learning EBP. Furthermore, there are no studies specific to the impact of race/ethnicity on learning EBP. This is important as innovations in learning strategies, as previously reported in the literature, can be less effective for racial/ethnic minorities.

Purpose: The primary purpose of this research project was to measure the perceptions of undergraduate nursing students about EBP use, attitudes, knowledge, and skills in a nursing curriculum with threaded EBP experiential learning activities. Secondarily, the program level (semester and year) and the relationship of race/ethnicity on learning EBP was evaluated.

Design: Non experimental descriptive cross sectional study.

Methods: One hundred and fifteen undergraduate nursing students from a large university nursing program in Texas voluntarily participated in an online survey in 2016 (November 30 to December 21) to assess their perceptions related to level of practice, attitudes, skills, and ability to apply evidence in clinical practice. This sample included four cohorts: 1) Junior year, semester 1 (Jr1), 2) Junior year, semester 2 (Jr2), 3) Senior year, semester 1 (Sr1), and 4) Senior year, semester 2 (Sr2). The Student Evidence-based Practice Questionnaire (S-EBPQ), a psychometrically validated instrument used to measure the practice, attitude, knowledge, and skills specific to the EBP of nursing students, was used for this project. The instrument was adapted from the Evidence-based Practice Questionnaire (EBPQ), an earlier robust instrument to measure EBP in professional nurses and nurse educators. Students who agreed to participate anonymously access and complete a demographic questionnaire and the 21-item S-EBPQ by clicking on a PsychData link embedded in an email sent to students currently enrolled in the nursing program. The S-EBPQ questionnaire was subjected to an inter-item reliability analysis using Cronbach’s alpha to determine the reliability of the scale items. All four subscales (practice, attitude, retrieving and reviewing evidence, and sharing and applying EBP) demonstrated high inter-item
reliabilities consistent with previous research. The study was approved by the university institutional review board.

**Results**: Several one-way ANOVA tests were used to compare practice, attitude, retrieving and reviewing evidence, and sharing and applying EBP among the Jr1, Jr2, Sr1 and Sr2 cohorts. Although Sr2 students were anticipated to have a higher self-perception of competencies and attitude as assessed by the four subscales than the other cohorts, no significant differences were found in any outcomes. Additional one-way ANOVA tests were conducted to determine if attitude, practice, retrieving and reviewing evidence, and sharing and applying EBP differed among self-identified race/ethnicity. Asian students reported a higher score ($M = 5.22$, $SD = .97$) in practice than Black students ($M = 3.85$, $SD = 1.77$), $F(4, 110) = 4.45$, $p = .002$. Hispanic students reported significantly higher score ($M = 5.49$, $SD = .63$) in sharing and applying EBP than Black students ($M = 4.12$, $SD = 1.49$), $F(4, 110) = 3.88$, $p = .005$. However, there were no significant differences on attitude, retrieving and reviewing evidence or application of EBP by self-identified race/ethnicity.

**Conclusions**: This is the first study reported in the literature to use the S-EBPQ to compare the EBP use, attitudes, knowledge, and skills in undergraduate nursing students by semester cohort and self-identified race/ethnicity. Undergraduate nursing student self-perceptions of practice, attitude, retrieving and reviewing evidence, and application of EBP may be indicative of a degree of evidence-based competency achievement; however, there also appears to be an opportunity for improvement in all four subscales. There appears to be a difference in the confidence with EBP practice for Asian students scoring highest, and those of Black students scoring the lowest. When examining the subscale of sharing and applying EBP, Hispanic students scored significantly higher than Black students. There were less Blacks (13%) that participated in the study when compared to Caucasians, Asians, Hispanics, and other ethnicities (41%, 32%, 23%, 6% respectively) and this may have impacted findings related to race/ethnicity. Further research is necessary to explore the differences by race/ethnicity as well as to understand the similar confidence levels across the cohorts.

**Clinical Relevance**: Self-perception of practice, attitude, skill and application of evidence-based practice and competency may not be indicative of actual competency. The comparison of summative evaluations of EBP skills with self-perceptions of EBP value and competency throughout the nursing program could further define the importance of self-perceptions. There were differences in learning by race/ethnic in learning EBP throughout the cohorts. These differences need to be further explored to understand the etiology. Also, the active learning methodologies believe to be the most effective in developing high levels of EBP competency could be explored during this process. EBP is currently threaded through the curriculum where this study was conducted, with a variety of active learning components incrementally added with the goal of increasing EBP competency as the student nears graduation. As there was not a significantly different assessment between the different cohorts, by semester and year, the learning activities need to be evaluated with a focus on revisions to scaffold the learning. The threading of the EBP skills should be re-evaluated to determine whether the leveling of learning and practice is truly incremental. A multi-country assessment and comparison of nursing student self-perception of attitudes and skills related to evidence-based practice along with corresponding cohort summative evaluations of EBP skills as students progress through the nursing program could be helpful in addressing EBP competency achievement on a global scale.

**Title:**
Evidence-Based Practice Use, Attitudes, Knowledge, and Skills: Curriculum Design and the Perceptions of Nursing Students
Keywords:
Evidence Based Practice, Nursing Curriculum and Student Nurse

References:


Abstract Summary:

This study evaluated the impact of embedding EBP through the nursing curriculum, with experiential learning activities, on EBP use, attitudes, knowledge, and skills of undergraduate nursing students. Recommendations specific to the purposeful scaffolding of the learning activities are discussed. Also, differences in the outcomes of students by race/ethnicity are described.

Content Outline:

Overview: Following significant curriculum development to thread evidence-based practice (EBP) competencies through an undergraduate nursing curriculum at one of the largest nursing programs in the United States, an instrument was necessary to evaluated perceptions of nursing students about their level of competency as they move through the program. As such, the Student Evidence-based Practice Questionnaire (S-EBPQ), by Upton, Scurlock-Evans, & Upton (2013), was implemented in a pilot project to assess student self-perceptions of EBP use, attitudes, knowledge, and skills. The instrument provided robust data about the student perceptions, including subgrouping by cohort, year/semester, and ethnicity/race. The findings from this study, along with recommendations for strategies for threading EBP...
through an undergraduate program with a scaffolding approach, could easily be refined and replicated for implementation nationally and internationally.

I. Background
   A. Historical documents driving EBP education and practice
   B. Literature review summary

II. Research Study
   A. Purpose
   B. Design
   C. Theoretical underpinnings (Dewey’s Experiential Learning)
   D. Sample population
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   F. Methodology
      1. Instruments
      2. Procedure
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III. Limitations
   A. Potential disparity between self-perceptions and actual competency
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IV. Conclusions
   A. Cohort
   B. Race/ethnicity

V. Clinical relevance
   A. Self-perceptions
   B. Summative competency evaluation
   C. Global relevance

First Author

Joan E. Edwards, PhD, RNC, CNS, FAAN
Texas Woman's University
Center for Global Nursing
Associate Professor and Director
Houston TX
USA

Professional Experience: Dr. Edwards, Associate Professor and Director of the Center for Global Nursing Scholarship at the College of Nursing, Texas Woman's University (TWU) is responsible for oversight and coordination of global nursing scholarship activities involving alumni, nursing faculty, students from all three campuses of Texas Woman’s University. Prior to accepting a her faculty appointment, Dr. Edwards was employed as a perinatal clinical nurse specialist with oversight of perinatal, neonatal, pediatrics and women’s services. She is certified in high-risk perinatal nursing and has been professionally affiliated with the specialty nursing organization, AWHONN for most of her nursing career, serving as national President in 2006. Throughout her professional career, Dr. Edwards has had opportunity to practice globally. She spent four years in the country of Indonesia as a medical missionary, teaching in a nursing program located in the jungles of Kalimantan. And, in 2011-2012 she returned to Indonesia as a Fulbright Scholar.

Author Summary: Dr. Edwards, Associate Professor and Director of the Center for Global Nursing Scholarship at Texas Woman's University is responsible for the oversight and coordination of global nursing activities involving alumni, nursing faculty, and students from all three campuses. Previously, she was a perinatal clinical nurse specialist with oversight of perinatal, neonatal, pediatrics, and women’s
services. Dr. Edwards practiced globally through her career, including as a Fulbright Scholar in Indonesia. She served AWHONN as National President.

Second Secondary Presenting Author

**Corresponding Secondary Presenting Author**

Sandra Cesario, PhD, MS, RNC, FAAN
Texas Woman's University
Nelda C. Stark College of Nursing
Professor and Doctoral Program Coordinator
Houston TX
USA

**Professional Experience**: Dr. Cesario is a woman’s health specialist with almost 40 years of clinical, research, education, and policy development experience. She has provided care to women and newborns throughout the United States and internationally and was inducted as a Fellow in the American Academy of Nursing in 2008. Dr. Cesario has held leadership positions in professional nursing organizations such as AWHONN, Sigma Theta Tau International, and the Texas Nurses Association District 9. She was awarded AWHONN’s Distinguished Professional Service Award in 2012. She also served on the Board of Directors for the Texas Medical Center Women’s Health Network for six years (president 2010-2011). Currently she is a member of the steering committee for the Women’s Health Initiative of Texas.

**Author Summary**: Dr. Cesario is the PhD program coordinator in the College of Nursing on the Houston campus. As a full member of the graduate faculty, she assists graduate nursing students in their research activities and grant or scholarship funding as they complete their dissertations, theses, and professional papers and projects. She has also served as the Director of Research for the CON on the Houston campus.

Third Author

Allison Huffman, DNP, RN, FNP-C
Texas Woman's University
Houston J. and Florence A. Doswell College of Nursing
Assistant Professor
Dallas TX
USA

**Professional Experience**: 2011 D.N.P. St John Fisher College, Pittsford, New York, Nursing practice, 2001 M.S.N. Texas Woman's University, Denton, TX, Family Nurse Practitioner 1997 BSN Texas Woman's University, Denton, Texas, Nursing

**Author Summary**: 16 years clinical experience as a Family Nurse Practitioner, 20 years total nursing experience. 9 years teaching experience, with 5 full time years teaching at TWU. Currently lead Dallas FNP and teach in DNP program.

Fourth Author

Tuong Vi Ho, PhD, FNP, CNS, RN
Texas Woman's University
Nelda C. Stark College of Nursing
Associate Clinical Professor
Houston TX
USA
**Professional Experience:** PhD 2006 - Texas Woman’s University AGNP 1995 - UT Health Science Center at Houston Practices actively in Houston, Texas FNP 2002 - post graduate - Houston Baptist University

**Author Summary:** Being a clinician and an educator, Dr Ho has spent years in treating patients in family and oncology health across the globe. She also has taught nurses and nursing students in area of Asian cultures, health and disease prevention and the applications of evidence based nursing practice.

Fifth Primary Presenting Author

**Primary Presenting Author**

Susan Mellott, PhD, RN, CPHQ, CPPS, FNAHQ
Texas Woman's University
Nelda C. Stark College of Nursing
Associate professor
Houston TX
USA

**Professional Experience:** Dr. Mellott has been an Associate Professor at TWU since 2012, teaching in the undergraduate and graduate programs. She has been a nurse since 1973 and has worked as a bedside nurse, clinical nurse specialist, Assistant Professor (8 years at Univ. Of Texas SON, Houston), a CNO, and at a healthcare system corporate office as the Manager of Nursing for the system. She was certified in performance improvement in 1991 and certified in patient safety since 2015. She attended the Academy for Emerging Leaders in Patient Safety Workshop for Faculty in 2015. She has research in patient safety and speaks around the country on patient safety, quality, and performance improvement.

**Author Summary:** Dr. Mellott has focused on healthcare quality and patient safety in multiple settings. She has experience with patient safety, improving patient/customer satisfaction and quality, decreasing costs, and team work. Dr. Mellott is an Associate Professor of Nursing for Texas Women's University in Houston. Dr. Mellott has holds certification in patient safety and performance improvement, and is a Fellow of NAHQ. Dr. Mellott's research is in patient safety and she has numerous publications.

Sixth Author

Peggy A. Landrum, PhD, MS, RN, CS
Texas Woman's University
Nelda C. Stark College of Nursing
Clinical Professor
Houston TX
USA

**Professional Experience:** 1995-present: Faculty, Texas Woman's University Research interests: interprofessional factors in patient safety considerations; safe practice in intensive care environments; recruitment and retentions of nurses; needs and problems of the emerging workforce; stressors and stress management among student nurses; and, access to care. My general background in human potential development, health promotion, and motivational interviewing informs this research effectively. My faculty position and research interests contribute to my interest in Sigma Theta Tau International.

**Author Summary:** Dr. Peggy Landrum, Clinical Professor at Texas Woman's University, is focused on behaviors among professional health care providers that affect patient safety. She has worked for several years with colleagues from Baylor College of Medicine and University of Houston College of Pharmacy to explore communication factors that promote and detract from patient care. More recently, she is working with teams to evaluate barriers and facilitators to obtaining health insurance coverage.
Seventh Author
Juan M. Leyva-Moral, PhD, MSc, BN, RN
Universitat Autònoma de Barcelona
Departament d'Infermeria, Facultat de Medicina
Assistant Professor
Avda. Can Domenech, Campus UAB
Barcelona
Spain

Professional Experience: A Registered Nurse since 2001 with clinical and management experience in primary & community Care. Earned a postgraduate diploma in HIV/AIDS care. An expert in vulnerable population and sexual education, both planning and assessing interventions. A professor at the Universitat Autònoma de Barcelona, Departament d'Infermeria (Barcelona, Spain) and a Senior Research Fellow at the Centro de Investigación y Desarrollo en Ciencias de la Salud, Universidad María Auxiliadora (Lima, Peru).

Author Summary: Dr. Leyva is an expert in global health, focused on vulnerable populations and HIV/AIDS. He is an assistant professor at the Universitat Autònoma de Barcelona, senior research fellow at the Centro de Investigación y Desarrollo en Ciencias de la Salud, Universidad María Auxiliadora (Lima, Peru), and researcher at the EnfAmericas Research Center, Institute of Global Nursing. He was a visiting scholar at Texas Woman's University and remains a member of the Center for Global Nursing.

Eighth Secondary Presenting Author

Corresponding Secondary Presenting Author

Patrick A. Palmieri, DHSc, EdS, PGDip(Oxon), MBA, MSN, RN, CPHQ, CPHRM, FACHE, FAAN
Universidad Norbert Wiener
School of Nursing, Faculty of Health Sciences
Dean and Margaret Jean Watson Distinguished Professor
Urb. Santa Beatriz
Lima
Peru

Professional Experience: Dr. Palmieri is a leading health system leader and nurse scholar in South America. He is the Margaret Jean Watson Distinguished Professor of Nursing, Universidad Norbert Wiener; Research Professor, Universidad María Auxiliadora; and adjunct doctoral professor at Walden Univ.; Texas Woman's Univ.; and A. T. Still Univ. Dr. Palmieri completed postdoctoral training in Human Caring Science (Watson Caring Science Institute) and Evidence-based Health Care (Univ. of Oxford) and postgraduate programs in Patient Safety, Information Technology, and Teaching. Dr. Palmieri implemented a national quality improvement project that resulted in the first international accreditation in Peruvian history. Furthermore, he developed funded fellowships to train nurses in clinical specialties. Currently, he conducts research and mentors nurses in Bolivia, Chile, Colombia, and Peru. He is the President of the Asociación Peruana de Enfermería (Peruvian Nurses Association), and the founder of the EnfAmericas Research Center at the Institute for Global Nursing.

Author Summary: Dr. Palmieri is a Sigma Virginia Henderson Fellow and Foundation for Nursing board member. A recognized health systems expert and nursing leader, he works in South America, including Bolivia, Chile, Colombia and Peru. Notably, he achieved the first health care organization accreditation in Peruvian history with a nursing-led project. In addition, Dr. Palmieri directed the first fully funded nurse fellowship programs in South America. He lives in Bolivia and Peru with his wife and daughter.