The ACE-ERI: An Instrument to Benchmark EBP Readiness in Student and Clinician Populations

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Background

- The rapid emergence of evidence-based practice (EBP) as a new paradigm in healthcare quality improvement has created a need for an evaluation of EBP readiness in students and clinicians

- EBP is a key component of healthcare quality improvement:

    - Effective Healthcare - care based on the use of systematically acquired evidence (IOM, 2001).

    - Health Professions Education - health professionals employ evidence-based practice (IOM, 2003).

- Thus, there is a need to track progress in EBP readiness, preparedness, and competencies.

    - Valid and reliable methods are needed to assess individual learner readiness to employ EBP

- The established national consensus on competencies for EBP (Stevens, 2009) provided a credible guide for the preparation of present and future workforce in EBP and development of an instrument to assess current readiness to employ evidence-based quality improvement in nursing.

Objectives

- The objectives of this study were to:

    - Estimate the psychometric properties (reliability, validity, sensitivity) of the ACE Evidence-Based Practice Readiness Inventory (ACE-ERI) in both nursing student and clinician populations

    - Conduct exploratory investigation of factors related to EBP readiness.

Methodology

- The ACE-ERI was administered online using a web-based survey software, Survey Tracker, and consisted of 20 questions related to EBP competencies, a 15 question knowledge test, and a 10 question demographic sheet.

- The instrument was administered online to nursing students and clinicians (N =2380):

    - Hospitals: 6 sites (N=1887)

    - Students: 3 institutions (N=493)

- A sub-subsample of clinicians (N=111) was used for sensitivity measures to capture changes pre- and post- EBP intervention.

Instrument Development and Framework

- The ACE-ERI utilizes the ACE Star Model of Knowledge Transformation (Stevens, 2004).

    - The Star Model provides a framework with which to organize EBP processes and approaches (Figure 1).

    - Using the Star Model, national competencies for EBP were established (Stevens, 2009).
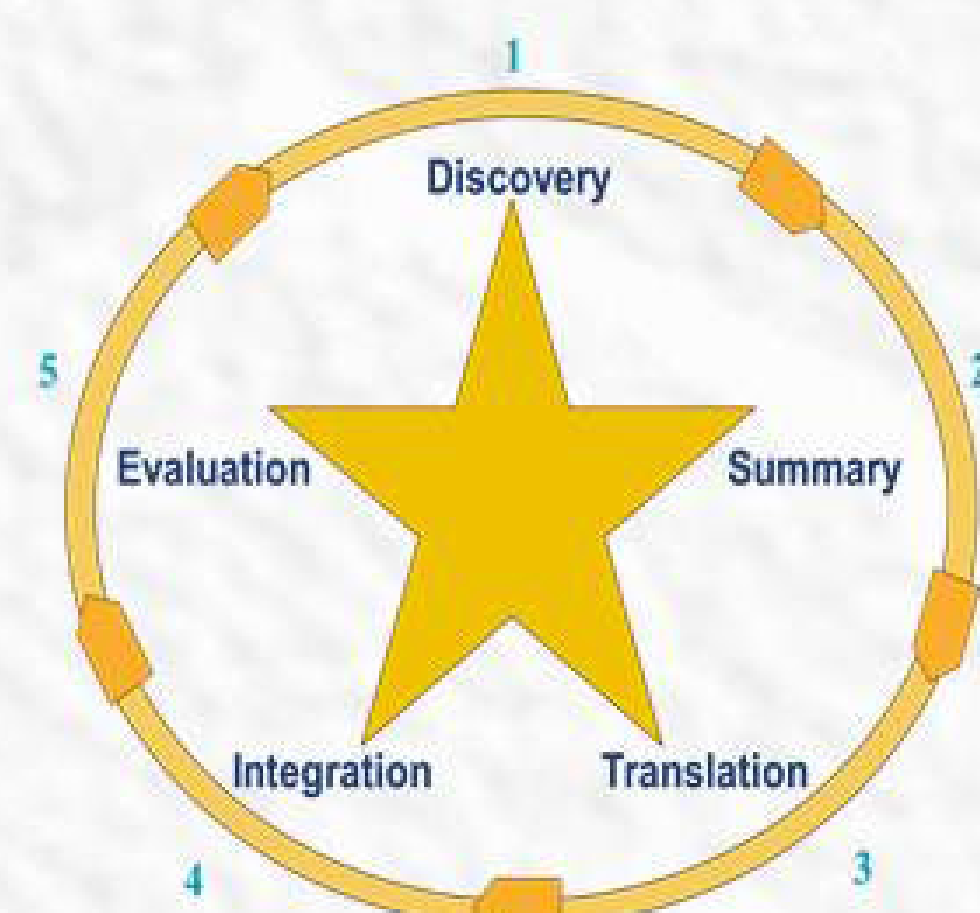

Figure 1. The ACE Star Model of Knowledge Transformation. The Star Model depicts various forms of knowledge in a relative sequence, as research evidence is moved through several cycles, combined with other knowledge, and integrated into practice.

Table 1. ACE Star Model Stages of Knowledge and performance competencies

STAR POINT	PERFORMANCE COMPETENCY
1 Discovery	"Recognize ratings of strength of evidence when reading literature including web resources"
2 Summary	"List advantages of SRs as strong evidential foundation for clinical decision making"
3 Translation	"Using specified databases, access CPGs on various clinical topics"
4 Integration	"Assist in integrating practice change based on EB CPGs"
5 Evaluation	"Participate in EB quality improvement processes to evaluate outcomes of practice changes"

- The ACE-ERI was developed to measure the ability to perform essential nursing competencies in EBP

- Using self-efficacy as a basis, the competencies are presented in a Likert-type scale.

- The instrument is scored as a summated scale; yielding interval-level data.

- Five versions of the ACE-ERI were created and include basic (UG) or intermediate (Masters) levels for (a) clinicians or (b) students and an advanced level for students.

Results

Table 1. Composite subscale scores and reliability categorized by points on the ACE Star Model

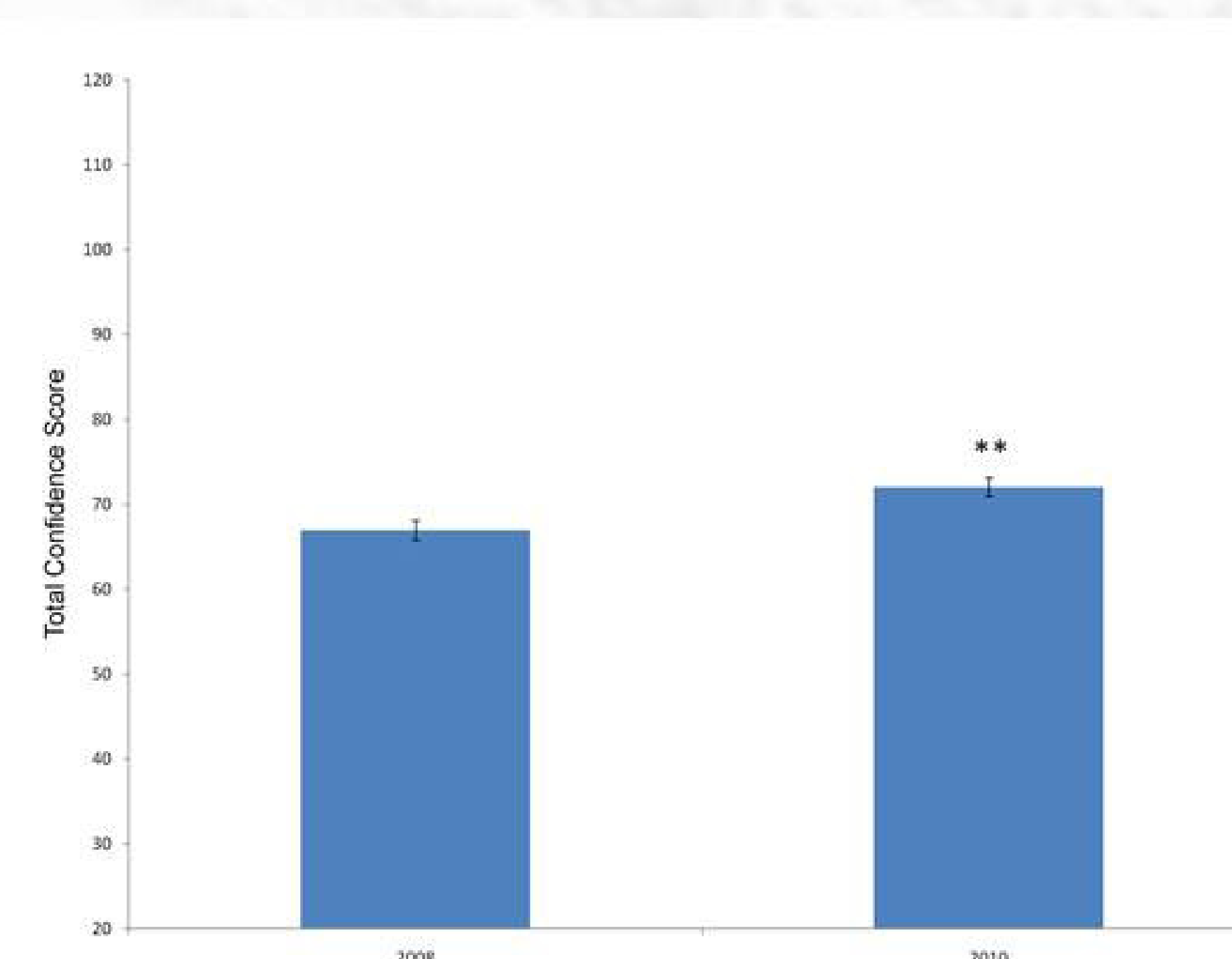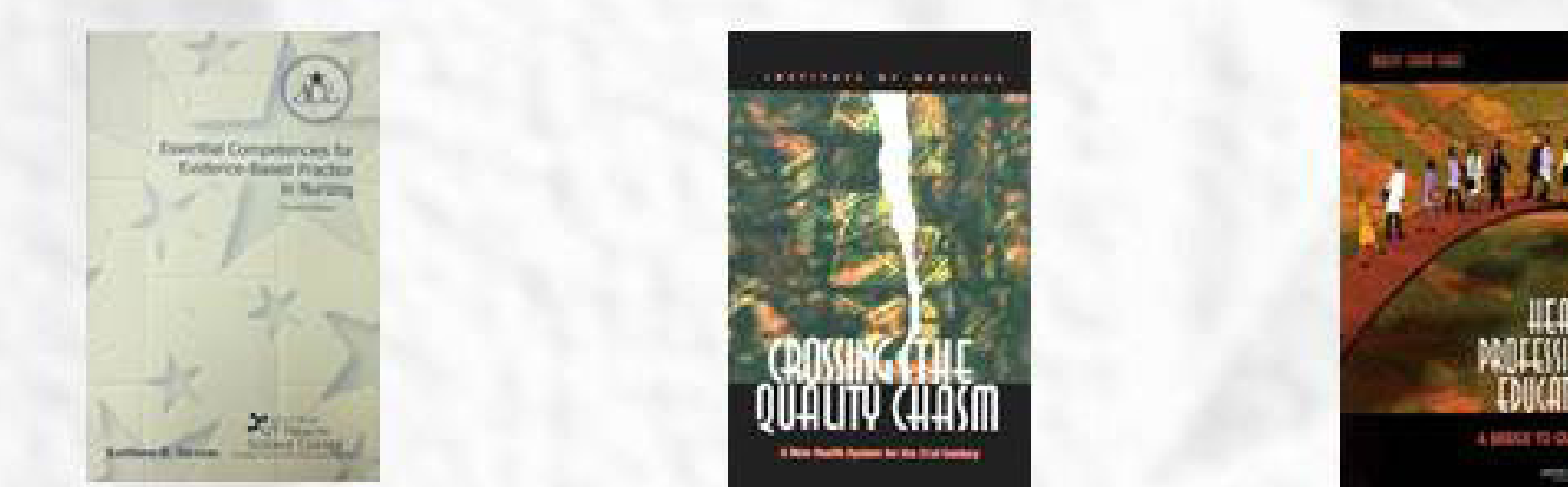| Basic Competencies	Range	Mean	SD	Normally Distributed	Cronbach's Alpha (α)
(N = 2,380)					
Primary Research	4 - 24	13.44	4.94	✓	.94
Evidence Summary	4 - 24	12.75	5.09	✓	.94
Translation	3 - 18	9.68	3.87	✓	.91
Integration	7 - 42	26.07	9.14	✓	.96
Total Score	20 - 120	68.97	24.04	✓	.98

Figure 1. ACE-ERI sensitivity measures in a clinical population. Data collected pre- (2008) and post- EBP intervention (2010). There was a significant increase in self-reported total confidence from 2008 to 2010 (N = 111; **p<0.01).

Measure of Validity:

- Significant, weak, direct (+) relation between confidence and knowledge scores ($r = .20$)

- Discriminate analysis revealed 1 significant function separating those reporting No EBP Knowledge from those reporting Intermediate/Advanced EBP Knowledge in the student population (Wilk's λ = .646, X^2 (10) = 391.72, p<0.05).

Conclusions

- Reliability and validity of the instrument far exceeded expectations of a new research instrument.

    - Reliability and validity levels suggest that users can be confident in the instrument scores.

    - ACE-ERI scores are significantly correlated with scores on EBP knowledge and implementation instruments

- Use in pre- post- research designs with clinicians show that the ACE-ERI is sensitive enough to detect differences across a two-year intervention period.

    - Results from this study demonstrated that the ACE-ERI can be used in clinical and student populations to measure self-efficacy on detailed levels of EBP competencies across time.

- Results from this study demonstrated that the ACE-ERI can be used in student populations and clinical populations to measure self-efficacy on detailed levels of EBP competencies across time.

- Analysis s of the ACE-ERI's sensitivity to detect changes in a student population is currently in progress.

    - Local undergraduate nursing courses are being evaluated at the beginning and end of each semester.

- The survey instrument is available to other investigators through the Improvement Science Research Network as an online survey.

References

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Acknowledgments