UNIVERSITY of WESTERN STATES
Integrating Health and Science

EVIDENCE-BASED PRACTICE GRANT
STUDENT QUESTIONNAIRE

Student Knowledge

Cohort 6
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Mitch Haas, Ron LeFebvre, Dave Peterson

We would be grateful for your voluntary response to this survey regarding your current attitudes towards clinical research and the behaviors of clinical practitioners.

University of Western States is a recipient of a large education grant from the Center for Complementary and Alternative Medicine at the National Institutes of Health. The goals are to improve chiropractic practice through the more efficient use of current scientific evidence. As part of this grant, we are required to monitor student knowledge, attitudes, and clinical performance.

All information on this survey is confidential and anonymous. None of your instructors will have access to your individual surveys.

Since we will be evaluating changes over time, we will need a unique identification number to match your surveys in our computer database. Please enter the last 5 digits of a phone number you can remember such as a cell phone number.

□ **I do not want this to be used for research purposes.**

ID # □□□□□

(The last 5 digits of a phone number you can remember such as a cell phone number.)

A. Practice Attitudes Questionnaire

The questions below address your current views regarding clinical research and the behaviors of clinical practitioners. Please circle a number under each statement to indicate the extent to which you agree or disagree with that statement.

1) Research evidence is more important than clinical experience in choosing the best treatment for a patient.

1	2	3	4	5	6	7
disagree strongly			neither agree or disagree			agree strongly

2) For almost all research articles, the Abstract contains all the information you need to know about the study findings.

1	2	3	4	5	6	7
disagree strongly			neither agree or disagree			agree strongly

3) When you are confronted with a specific problematic clinical case, the best resource for practitioner is the advice of a senior colleague you respect for his or her clinical skills.

1	2	3	4	5	6	7
disagree strongly			neither agree or disagree			agree strongly

4) Because most clinical research articles report results for groups of patients rather than individuals, their applicability to the care of an individual patient may be unclear.

1	2	3	4	5	6	7
disagree strongly			neither agree or disagree			agree strongly

5) It is very important for a full-time practicing chiropractor to spend at least two to three hours per week reading and reviewing current clinical research literature.

1	2	3	4	5	6	7
disagree strongly			neither agree or disagree			agree strongly

6) The typical chiropractor should seek current research evidence regarding appropriate diagnosis and treatment for at least ten percent of patients, rather than simply rely on clinical judgment.

1	2	3	4	5	6	7
disagree strongly			neither agree or disagree			agree strongly

7) Because many research findings are contradicted by later research, it is probably more effective to read a textbook rather than try to keep up with original findings published in research journals.

1	2	3	4	5	6	7
disagree strongly			neither agree or disagree			agree strongly

Practice Attitudes Questionnaire – continued

8) For clinical practitioners, a high priority for continuing medical education courses should be further education in skills that can be used in interpreting research findings.

1	2	3	4	5	6	7
disagree strongly			neither agree or disagree			agree strongly

9) Most of the time, a good case study will help you understand how to treat a condition better than a randomized clinical trial.

1	2	3	4	5	6	7
disagree strongly			neither agree or disagree			agree strongly

B. Skills Self-Appraisal

1) How much time do you typically spend each month reading original research articles in professional journals? (circle one)
   a) None
   b) One hour or less
   c) More than one hour but less than five hours
   d) Five to ten hours
   e) More than ten hours

2) In your own clinical work, how frequently do you use the specific methods and approach of evidence-based practice? (circle one)
   a) Never
   b) Rarely, with less than one per cent of patients
   c) With about one to two percent of patients
   d) With more than two percent but less than five percent of patients
   e) With five percent to ten percent of patients
   f) With more than ten percent of patients

3) How much time do you typically spend each month accessing PUBMED or similar databases of health-related research literature? (circle one)
   a) None
   b) One hour or less
   c) More than one hour but less than five hours
   d) Five to ten hours
   e) More than ten hours

For each of the items below, please circle a number between "1" and "7", where "1 = not at all competent" and "7= very competent". Please answer all questions.

How would you rate your skills in the following areas:

a) Ability to identify, find and retrieve relevant research-related information

1 2 3 4 5 6 7

b) Ability to critically evaluate whether or not a research study was well-done.

1 2 3 4 5 6 7

c) Ability to integrate research findings into teaching or clinical decision-making

1 2 3 4 5 6 7

d) Ability to understand basic statistical concepts used in scientific research

1 2 3 4 5 6 7

C. Evidence-Based Practice Student Knowledge Exam

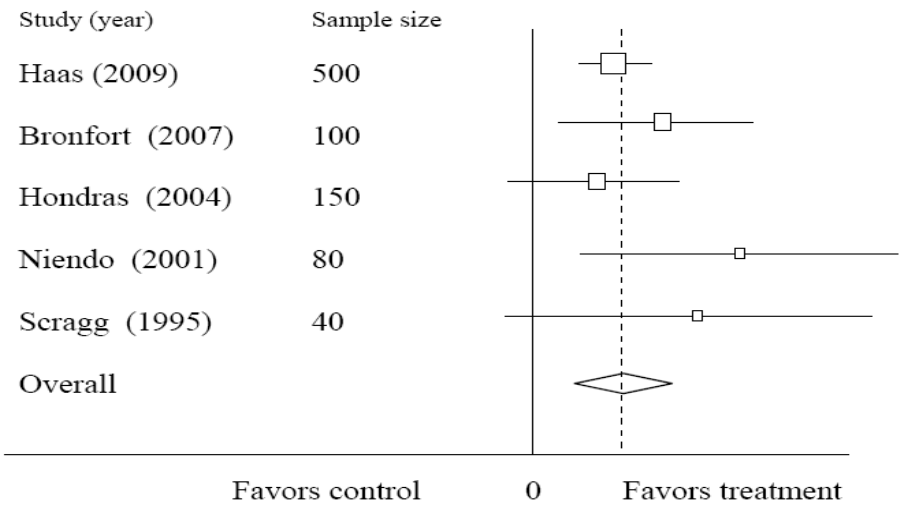
1. In a recent research study of 16,000 women, the risk of stroke in those taking hormone replacement therapy (HRT) was 0.31% and the risk of stroke in those taking placebo was 0.24%. Which of the following represent the absolute risk of stroke in women taking HRT when compared to women who did not take HRT?
   a. (0.31%) – (0.24%) = (0.07%)
   b. (0.31%) / (0.24%) = 1.3
   c. 16,000 / (0.31%) = 51,613
   d. (0.24%) / 16,000 = (0.000015)

2. A clinical prediction rule could be used to identify which of the following?
   a. Factors which increase the reliability of physical exam procedures
   b. Manipulation psychomotor skills most likely to be associated with improved patient outcome
   c. Diagnostic physical exam procedures ranked by test accuracy
   d. Exam findings which identify a cohort of patients more likely to respond to manipulation

3. A 95% confidence interval reflects which of the following?
   a. The full range of values that surround each reported result
   b. An estimate of the range of values that someone would be 95% confident to include the true value
   c. The range including 95% of positive tests favoring treatment over control
   d. 95% confidence among the researchers regarding the reported values

4. As a general principle, when a confidence interval for a mean difference between an intervention and a control group includes the value of 0, which of the following is true?
   a. Both the intervention and control therapies are effective.
   b. If half of the confidence interval is in the positive range, it is an effective intervention
   c. The range of the confidence interval doesn't matter as long as the p value is acceptable
   d. By convention, we do not have sufficient confidence to accept the intervention as more effective than the control group

Reading the forest plot below, answer questions 5 & 6



5. The diamond in the forest plot above represents
   a. The result of the best individual study and its confidence interval
   b. The average number of combined side effects of all studies
   c. The dividing point between clinical and statistical significance for all studies
   d. The combined treatment effect of all studies and its confidence interval

6. How many of the studies above suggest that the sample sizes may have been too small for the studies to draw statistically significant conclusions?
   a. 5
   b. 0
   c. 2
   d. 3

7. A study on inter-examiner reliability of motion palpation for finding a joint restriction was reported to have kappa value of 0.46. What does this mean?
   a. The examiners agreed 46 percent of the time
   b. The examiners correctly found the restricted joint 46% of the time
   c. The examiners agreed 46% more often than would have occurred by chance
   d. The examiners were incorrect in their assessment 54% of the time.

8. The positive predictive value is computed from
   a. Test sensitivity, prevalence, and interexaminer reliability
   b. Test sensitivity, specificity, and prevalence
   c. Test sensitivity, specificity, and interexaminer reliability
   d. Test specificity, prevalence, and pre-test probability

9. In which of the following situations would regression analysis be commonly used?
   a. To identify an association between smoking and heart disease controlling for other risk factors.
   b. To calculate the confidence interval around the number needed to treat carpal tunnel patients with a night splint
   c. To convert an absolute improvement in pain to an NNT in a therapy study on manipulation
   d. To calculate a likelihood ratio for an orthopedic test if given the test sensitivity and specificity

10. The definition of a systematic review is
   a. A summary of the literature by a panel of acknowledged experts in their fields
   b. An in-depth review of the literature that addresses a clearly defined clinical question by a panel of experts, resulting in a set of practice recommendations
   c. A published guideline on a clearly defined clinical question which is based on at least four randomized trials
   d. A literature review focused on a single question that tries to identify, select, appraise, present, and synthesize research evidence relevant to the question

11. You are reading a placebo controlled study about a supplement that reduces the risk of a rare cancer. There are a number of statistical terms that might be used to report the results. Which of the following puts the benefit of prevention in the best perspective for the individual patient?
   a. relative risk reduction
   b. harm ratio
   c. absolute risk reduction
   d. odds ratio

12. An RCT comparing spinal manipulation to mobilization demonstrated a mean <u>advantage</u> for manipulation of 20 points out of 100 on a visual analog scale. The mean 20 point <u>advantage</u> for spinal manipulation represents which of the following?
   a. Half of the patients had a reduction in pain of greater than 20 points and half had reductions of less than 20 points
   b. 20 represents the middle point of a skewed curve
   c. 20 points is the average reduction in pain manipulation patients had from the baseline starting point
   d. The mean pain score for manipulation was 20 points better than the mean pain score for mobilization

13. A patient is subjected to a diagnostic test with a positive likelihood ratio calculated to be 1.0. If this test is applied in the diagnostic workup of a patient, a positive test result will predict the likelihood of disease in the following manner:
   a. It will not change the predicted likelihood of disease at all
   b. It will substantially increase predicted disease likelihood
   c. It will slightly increase the predicted likelihood of disease (i.e., by one log unit)
   d. It will substantially decrease predicted disease likelihood

14. Which of the following likelihood ratios would be best at helping a physician rule out a condition?
    a. 1.0
    b. 0.5
    c. 0.1
    d. 0.05

15. The number needed to treat (NNT) is defined as the number of patients that must
    a. Enter a trial for the results to reach statistical significance
    b. Be treated for the treatment to demonstrate clinical efficacy
    c. Be seen for the cost-effectiveness of a treatment to be demonstrated
    d. Be treated in order that one additional therapeutic success is achieved

16. Which of the following NNTs would generally correspond to the most effective treatment?
    a. -3
    b. 3
    c. -30
    d. 30

17. Which of the following P-values would give us the greatest confidence that one treatment is truly different from another, regardless of effect size?
    a. .95
    b. .50
    c. .05
    d. .005

18. A p-value indicates which of the following when the null hypothesis is true?
    a. The probability that research findings were due to chance alone
    b. The power of the study to detect a real effect
    c. The predictive value of a risk factor
    d. The precision of the point estimate

19. A study reports that subjects eating a Mediterranean diet had a relative risk of 0.23 for getting coronary artery disease compared to those on a control diet. What does this mean?
    a. The difference between the two diets in risk of getting coronary artery disease was 23%.
    b. The risk of getting coronary artery disease with the Mediterranean diet was only 23% of the risk for the control diet.
    c. The chances of getting coronary heart disease were increased 23 times for subjects on the Mediterranean diet compared to the control diet.
    d. Subjects on the Mediterranean diet were 23% more likely to get coronary artery disease than those on the control diet.

20. A group of researchers studied the effect of drinking cranberry juice every morning as protection against urinary tract infections (UTI). The odds ratio (OR) compared the odds that subjects with UTI were cranberry juice drinkers compared to whether uninfected subjects were cranberry juice drinkers. Which of the odds ratios below represents the best job of preventing UTIs?
    a. OR 1.3
    b. OR 2.4
    c. OR 0.9
    d. OR 0.2

21. Clinical research studies employ randomization in an attempt to:
    a. Balance patient baseline characteristics and expectations of patients across comparison groups
    b. Allow studies with smaller number of subjects to be conducted
    c. Blind the patients from the therapy they are receiving
    d. Blind the experimenters to patient outcomes

22. A test has a 95% specificity and 40% sensitivity for the presence of cervical radiculopathy. Which of the following statements is true?
    a. If the test is positive on your patient, there is a 95% chance that he has cervical radiculopathy
    b. If the test is positive, it may be helpful in ruling in cervical radiculopathy
    c. If the test is negative, it may be helpful in ruling out cervical radiculopathy
    d. Knowing just these two numbers allows us to calculate the positive predictive value

23. Well-designed diagnostic accuracy studies incorporate which of the following elements.
    a. Convenient selection of subjects
    b. Inclusion criteria likely to ensure subjects have the disorder being tested
    c. Application of a reference (gold) standard test in all subjects
    d. Minimum of 50 subjects

24. Which statement below is a correct statement concerning a test which demonstrates high sensitivity?
    a. It has few false negatives
    b. It has few false positives
    c. It has a large number of false negatives
    d. It has a large number of false positives

25. Which of the following statements is true about the power of an RCT on therapy?
    a. If the results of the RCT are statistically significant, the results are believable only if the study is powered to .80 or higher.
    b. If the results of the study are not statistically significant and the study is underpowered, it means that the treatment is likely ineffective.
    c. If the results of the study are not statistically significant and the study is underpowered, it could mean that either the treatment is ineffective or the sample size is too small.
    d. If the results of the study are not statistically significant, power doesn't matter.

26. A prospective cohort study may not be an efficient research approach in certain instances. What are those instances?
    a. For the study of diseases or conditions where exposures or risk factors are difficult to measure
    b. For the study of rare diseases or conditions
    c. In the study of infectious diseases, because of cross-contamination among cohort members
    d. Where mortality may occur within the observation period

27. Allocation concealment refers to which of the following?
    a. A source of bias that goes unreported when potential sources of conflict of interest are not revealed in a paper
    b. A blinding step which prevents anyone on the research team from knowing or manipulating which group subjects are assigned to
    c. Steps taken to keep the initial sampling process a secret from the patients receiving the treatments
    d. A method for ensuring that baseline differences between subjects are concealed from the clinicians providing the treatments

28. Pretest probability represents the probability that a patient
    a. Will have a positive test
    b. Will have the disease before the test is applied
    c. With the disease will have a positive test
    d. Without the disease will have a negative test

29. Which of the following is <u>not</u> one of Hill's criteria for causality?
    a. Consistency
    b. Biological plausibility
    c. Conceptual simplicity
    d. Dose-response relationship

30. In a systematic review article, the presence of a table rating the quality score of the evaluated articles is a valuable feature because
    a. It shows the author has included all pertinent articles from the literature in his or her analysis
    b. It is indicative that critical analysis has been used to appraise the studies
    c. The presence of tables is one of the key criteria used when assessing the quality of a review article studies
    d. The table shows the author has gone to some length to integrate information from a wide variety of sources

31. Which of the following is the most accurate statement about evidence-based practice (EBP)?
    a. EBP practitioners use randomized controlled trials to make decisions on patient care
    b. EBP practitioners balance clinical experiences, patient preferences, and best available evidence to make decisions about patient care
    c. EBP was originally developed to reduce health care costs
    d. EBP is too expensive and is impractical for chiropractors to apply in solo practice

32. Which of the following is a standard step employed in EBP when searching for best evidence concerning a clinical problem?
    a. Start by searching Medline for relevant information
    b. First get a clinical opinion from a senior colleague which may make a literature search unnecessary
    c. Check reference books to eliminate unnecessary search time
    d. Structure the clinical information into an answerable question

33. Which of the factors below is most helpful in determining whether a study finding is applicable to your patient?
    a. The similarity of your patient to the patients in a study
    b. Whether or not the trial included a placebo or no-treatment control group
    c. He calculated size of the numbers needed to treat (NNT)
    d. The determination of whether there was author or reviewer bias

34. A test for meniscus tear of the knee has a sensitive of 35% and a specificity of 90%. Which of the following is the best interpretation of how this test performs?
    a. This test would be positive in most patients with a meniscus tear.
    b. A positive test indicates that there is a 90% post-test probability that the patient has a meniscus tear.
    c. A negative test would have little to no value in ruling out a meniscus tear.
    d. This test is likely to have more false positives than false negatives

35. The PICO acronym provides a structured approach for asking focused clinical questions. It refers to:
    a. Patient/disease – Intervention – Comparison intervention - Outcome
    b. Patient characteristics – Intended outcome – Condition – Other tx options
    c. Patient's health problem – Intervening factors – Care/treatment plan – Objective data
    d. Physiologic condition – Individual patient – Comorbidities – Outcome

36. Intention-to-treat refers to:
    a. Considering a wait-list research control design to be equivalent to a placebo control design
    b. Ignoring prognostic factors and baseline differences in the analysis of therapeutic outcomes
    c. Including in the analysis outcomes for all randomized subjects, including dropouts, in the groups they were originally assigned to
    d. Stopping a clinical trial <u>prior</u> to planned study completion when a high degree of statistical significance is achieved

37. Which would be the best string of search terms for the following search question, "How much can diet lower blood pressure?"
    a. Diet OR blood pressure OR hypertension
    b. Diet AND (blood pressure OR hypertension)
    c. Diet AND blood pressure AND hypertension
    d. Hypertension AND (diet OR blood pressure)

38. You want a good overview of the best research studies on the effectiveness of spinal manipulation for cervicogenic headache. Which of the following online resources would be the best place to start?
    a. PubMed clinical queries
    b. AHMED
    c. US Preventative Services Task Force
    d. Index to Chiropractic Literature

39. What is another important database for physical therapy-related research that can be searched in addition to MEDLINE?
    a. TRIP
    b. US Preventative Services Task Force
    c. EMBASE
    d. CINHAL

40. Patients in a randomized trial with high pain at baseline improve more than other patients regardless if they are in the treatment or control group. This is most likely an example of
    a. A placebo effect
    b. Regression to the mean
    c. Covariate confounding
    d. Spontaneous remission

Comments:

THANK YOU FOR YOUR PARTICIPATION.